IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 507 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV. 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Airline Models
GAA-3501,
GAA-3502

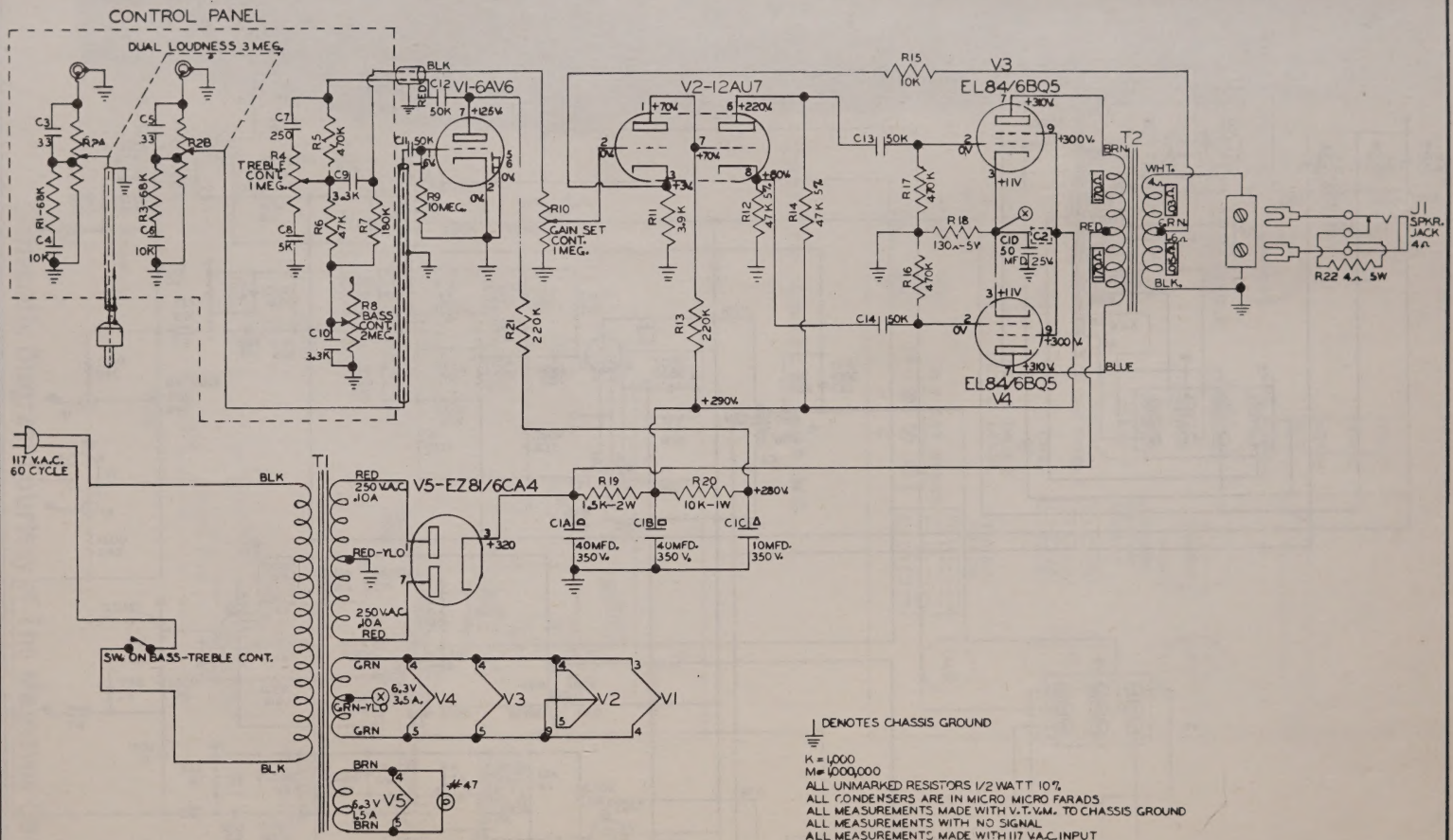
Magnavox Chassis
AMP-81 Series

SPEAKER SWITCH WIRING

SWITCH VIEW FROM KNOB END
SWITCH SHOWN IN EXTREME CCW POSITION

This chassis similar to AMP-182BA covered in PHOTOFACT FOLDER 9-SET450

Schematic Diagram Courtesy of The Magnavox Company



AIRLINE MODELS GAA-3501, GAA-3502

Schematic Diagram Courtesy of Montgomery Ward & Co.

PHOTOFACT® Folder

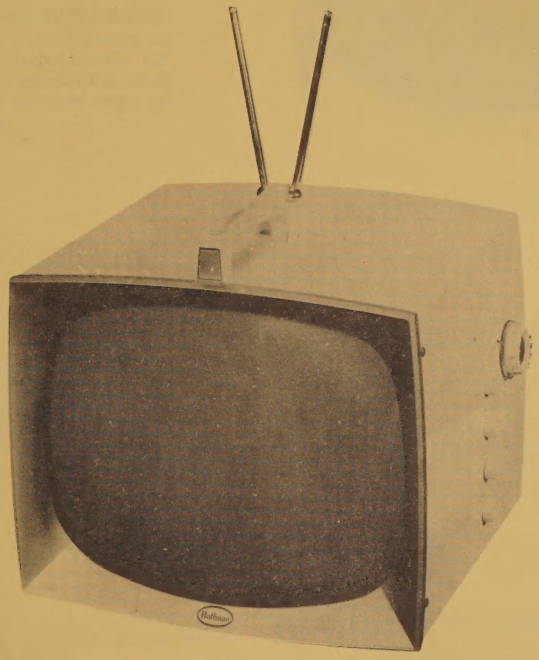
HOFFMAN
MODEL 1777 SERIES (Ch. 360)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

HOFFMAN
MODEL 1777 SERIES (Ch. 360)



HOFFMAN
MODEL 1777 SERIES (Ch. 360)

MODEL 1770 SERIES (CH. 360)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PHOTOFACT® Folder

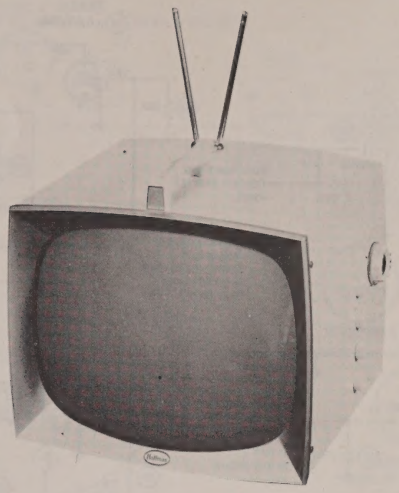
HOFFMAN
MODEL 1777 SERIES (Ch. 360)

HOFFMAN
MODEL 1777 SERIES (Ch. 360)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.



MODEL 1770 SERIES (CH. 360)

HOFFMAN
MODEL 1777 SERIES (Ch. 360)

TRADE NAME	Hoffman Model 1777 Series (Ch. 360)
MANUFACTURER	Hoffman Electronics Corp., Consumer Products Div., 6200 S. Avalon Blvd., Los Angeles, Calif.
TYPE SET	Television Receiver
TUBES	VHF - Thirteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1.1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the picture tube. See Disassembly Instructions, "Picture Tube Removal" on Page 16.

FUSE DEVICE

A 4.7Ω fusible resistor is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning Knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1). (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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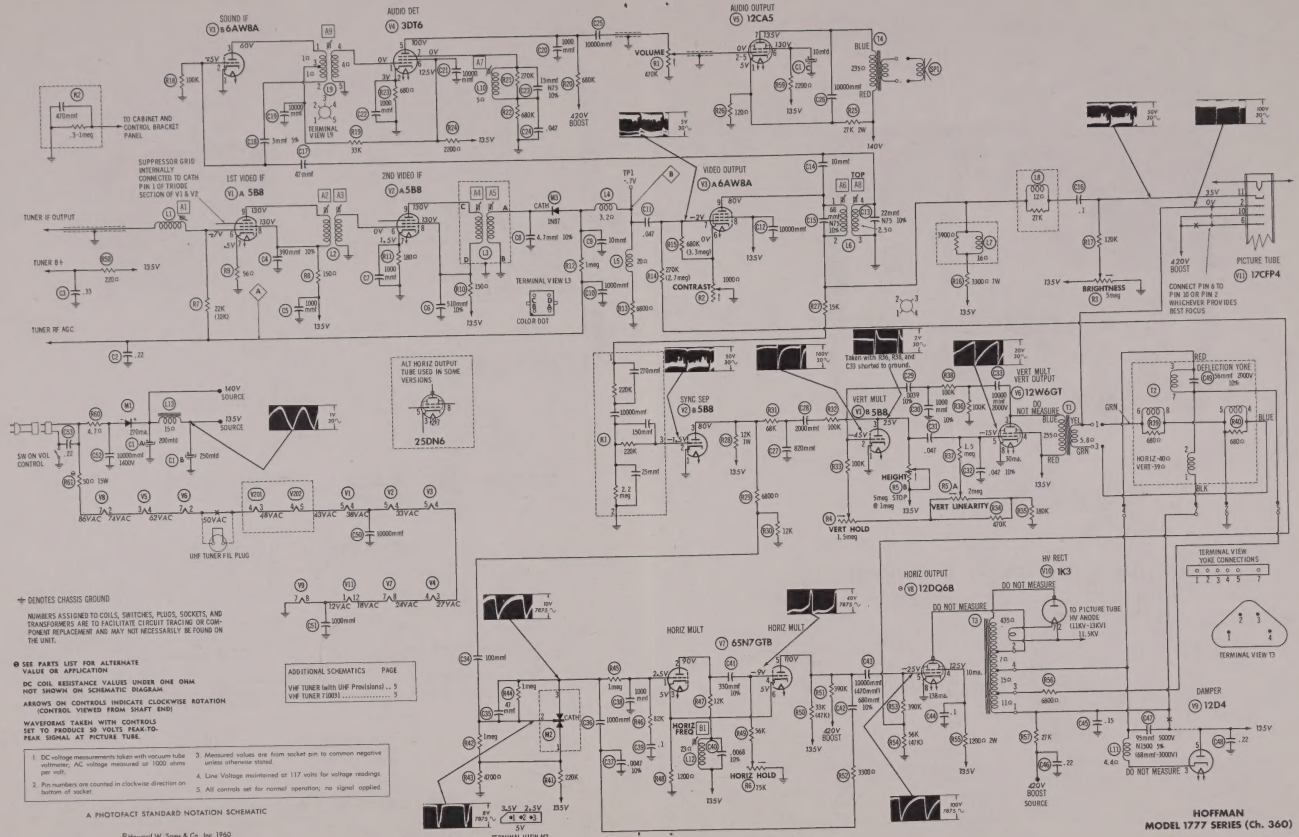
SET 507 FOLDER 1


HOFFMAN
MODEL 1777 SERIES (Ch. 360)
FOLDER 1
SOUND IF
V3 6AW8A
AUDIO DET
V4 3DT6
AUDIO OUTPUT
V5 12CA5
VOLUME
TO CABINET AND CONTROL BRACKET PANEL
TERMINAL VIEW L9
420V BOOST
SUPPRESSOR GRID INTERNALLY CONNECTED TO CATH PIN 1 OF TRIODE SECTION OF V1 & V2
1ST VIDEO IF
V1 A 5B8
2ND VIDEO IF
V2 A5B8
VIDEO OUTPUT
V3 6AW8A
TUNER IF OUTPUT
TUNER B+
TUNER RF AGC
TERMINAL VIEW L3
COLOR DOT
CONTRAST
TOP
PICTURE TUBE
V11 17CFP4
BRIGHTNESS
CONNECT PIN 6 TO PIN 10 OR PIN 2 WHICHEVER PROVIDES BEST FOCUS
ALT HORIZ OUTPUT TUBE USED IN SOME VERSIONS
25DN6
Taken with R36, R38, and C35 shorted to ground.
SYNC SEP
V2 5B8
VERT MULT
V1 5B8
VERT MULT VERT OUTPUT
V6 12W6GT
DO NOT MEASURE
HEIGHT
VERT LINEARITY
VERT HOLD
DEFLECTION YOKE
HORIZ-40Ω VERT-39Ω
SW ON VOL CONTROL
140V SOURCE
13.5V SOURCE
UHF TUNER FIL PLUG
HORIZ MULT
V7 6SN7GTB
HORIZ FREQ
HORIZ HOLD
HORIZ OUTPUT
V8 12DQ68
HV RECT
V10 1K3
TO PICTURE TUBE HV ANODE (11KV-13KV) 11.5KV
TERMINAL VIEW T3
TERMINAL VIEW YOKE CONNECTIONS
DAMPER
V9 12D4
DO NOT MEASURE
420V BOOST SOURCE
TERMINAL VIEW M2
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER (with UHF Provisions) .. 5
VHF TUNER (2003) .. 5
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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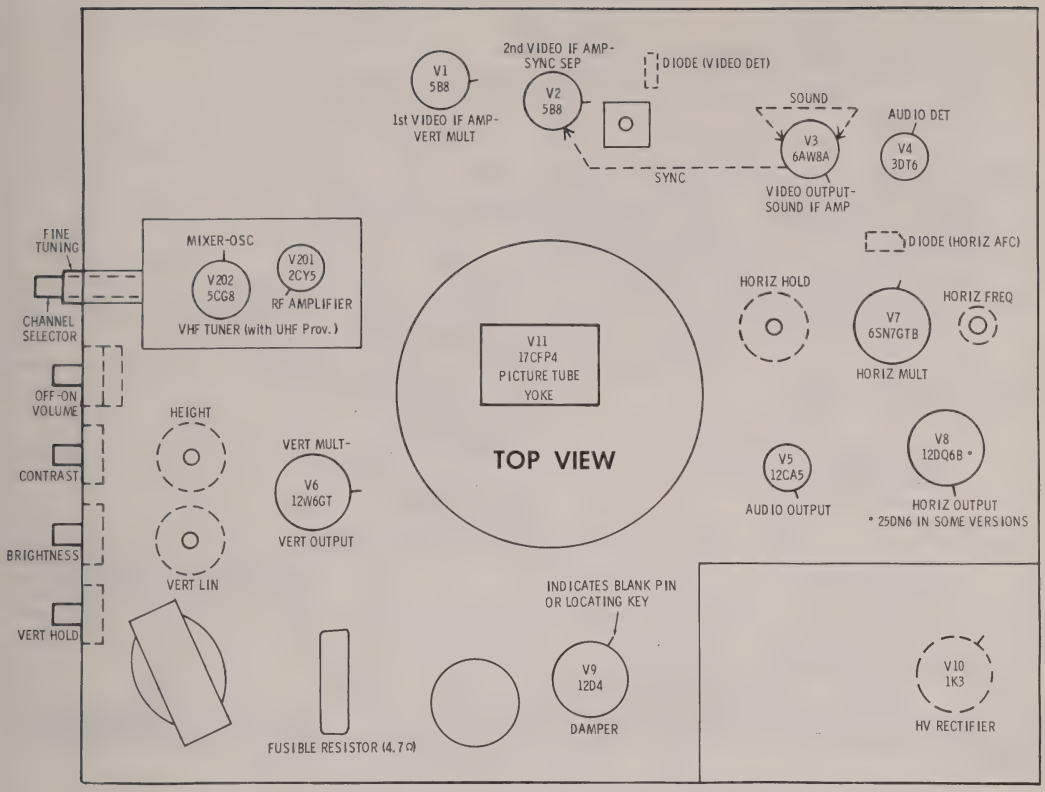
HOFFMAN
MODEL 1777 SERIES (Ch. 360)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

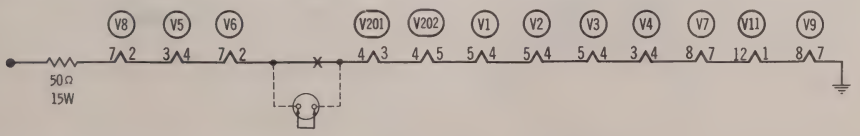
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (4.7Ω), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V7, V8, V9, V10, V11
No vertical deflection V1, V6
Poor vert. linearity or foldover V1, V6
Poor horiz. linearity or foldover V7, V8, V9
Narrow picture V7, V8, V9, Rectifiers (B+)
Vert. off freq. V1, V6
Horiz. off freq. Diodes (Horiz. AFC), V7

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V11
Has pic, no sound V3, V4, V5

SYNC FAILURE
No vert. sync V2
No horiz. sync V2
No vert. or horiz. sync V2

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SET 507 FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544, or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Short the antenna terminals together but not to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig.1) to pin 9 (plate) of 5B8 (V1). Low side to chassis.	Mixer Plate Coil & A1	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
2.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of 5B8 (V1). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V2). Low side to chassis.	A2, A3	"
3.	"	High side to pin 6 (grid) of 5B8 (V2). Low side to chassis.	"	"	"	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across video det. load).	A4, A5	"
4.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	"	"	"	"		Retouch Mixer Plate Coil and A1 thru A5 as required for response similar to Fig. 3. Remove bias and replace V202 in its socket.

SOUND IF ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	Not used	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A6	Turn A6 and A8 almost out of coil forms. Then adjust A6 for MINIMUM scope indication.
6.	"	"	4.5MC (15KC Swp)	Not used	"	Across speaker voice coil	A7, A8, A9	Use only enough sweep generator output to provide a usable pattern on scope. Turn A7 fully clockwise, then counter clockwise for maximum scope indication. Adjust A8 and A9 for maximum scope indication. Remove test equipment and tune in a local TV station. Retouch A7 for MINIMUM buzz.

TUNER ALIGNMENT INSTRUCTIONS PAGES 6 & 11

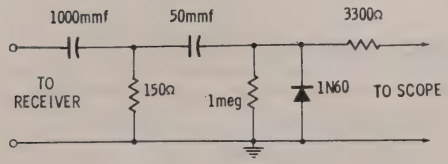


FIG. 1

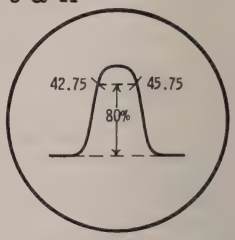


FIG. 2

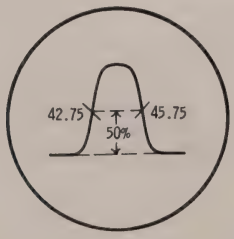


FIG. 3

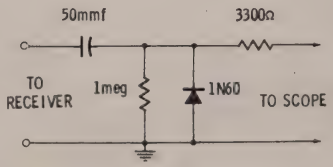
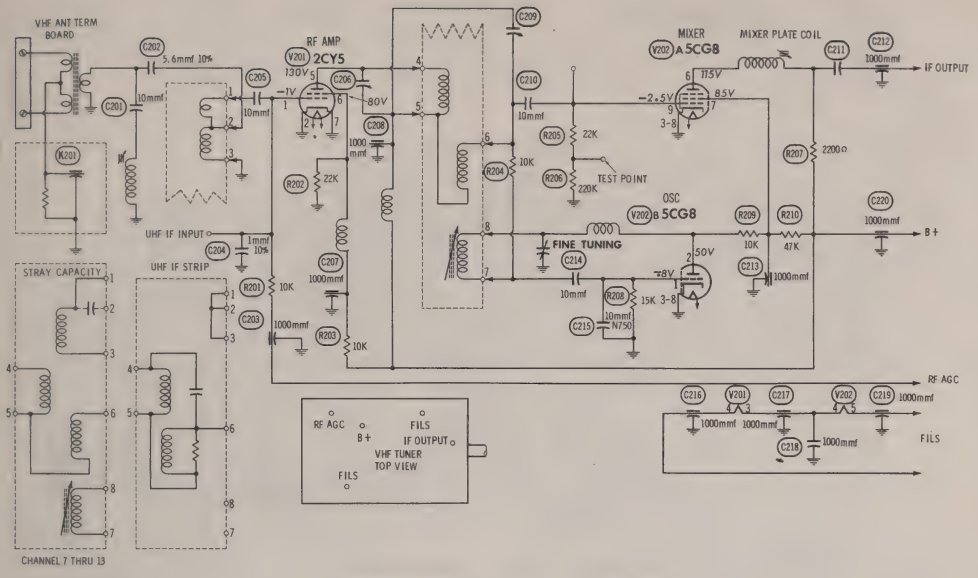


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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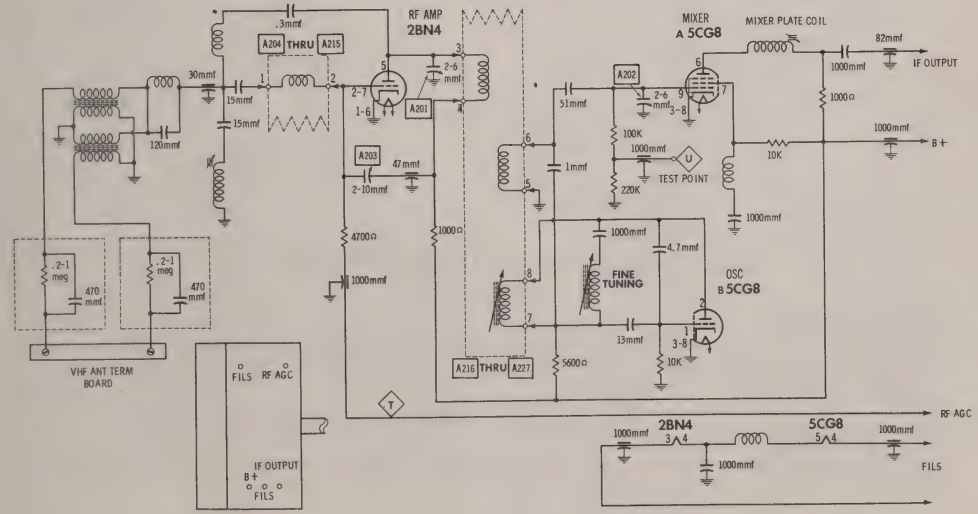
VHF TUNER with UHF Provisions



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 710031

HOFFMAN MODEL 1777 SERIES (Ch. 360)

FOLDER 1

TUNER PARTS LIST AND DESCRIPTIONS

VHF—UHF PROVISIONS

TUBES

• GENERAL ELECTRIC •			RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2CY5	V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	5.6 10%							10TCC-V56
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C205	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C206								
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1000		EF-001	MFT-1000		CCF-102	CT280A	
C209								
C210	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C211								
C212	1000		EF-001	MFT-1000		CCF-102	CT280A	
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C215	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	10K	
R202	22K	
R203	10K	
R204	10K	

ITEM No.	RATING	REMARKS
R205	22K	
R206	220K	
R207	2200Ω	
R208	15K	

ITEM No.	RATING	REMARKS
R209	10K	
R210	47K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA
K201	Antenna Filter			

TUNER ALIGNMENT INSTRUCTIONS

VHF—UHF PROVISIONS

VHF OSCILLATOR ALIGNMENT

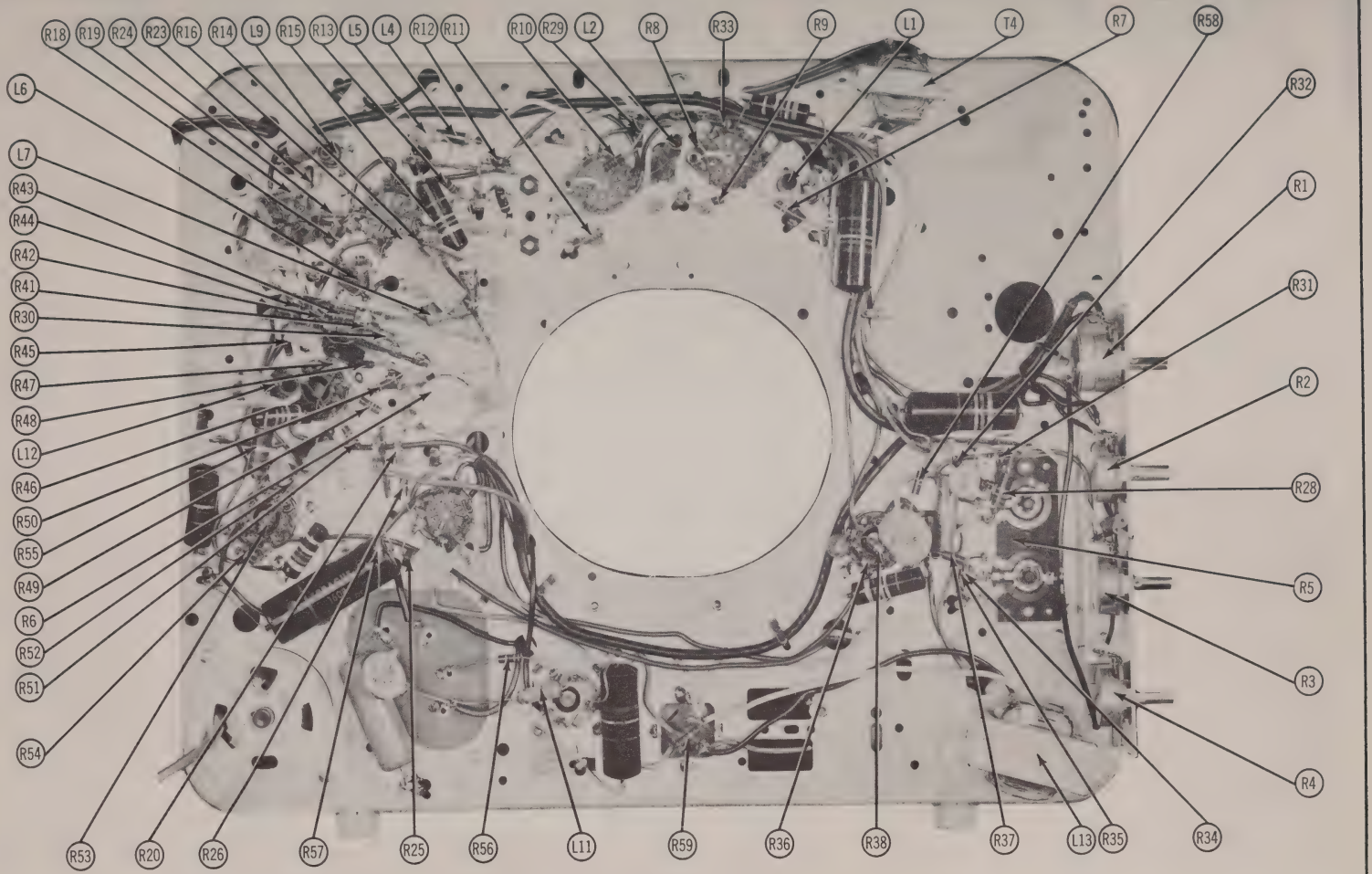
The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC * USE	TYPE	ITEM No.	RAYTHEON * USE	TYPE
V1	1st Video IF Amp. - Vert. Multi.	5B8	V5	Audio Output	12CA5
V2	2nd Video IF Amp. - Sync Sep.	5B8	V6	Vert. Multi. - Vert. Output	12W6GT
V3	Video Output - Sound IF Amp.	6AW8A	V7	Horiz. Multi	6SN7GTB
V4	Audio Det.	3DT8	V8	Horiz. Output	12DQ6B *
			V9	Damper	1B3
			V10	HV Rectifier	1K3

* Some versions of chassis 360 may use 25DN8 in this application.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V11	17CTP4	17CEP4 ①	17CEP4 ①	17CEP4 ①	17CTP4 ③	① Aluminized ② Silver Screen "B5"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■300	200	856R5	AFBB3-13-50	XD3253	FP31L S	TMD-58	TVLA-3490 *	
B	400	200			BH1045		TD-15-250		
C	40	200							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	RCA PART No.	SPRAGUE PART No.
C3	.33 300V		P288N-33		CUSB33	SDP4-334	GEM-3033		37M-P33
C5	.33 300V		P288N-33		DPM84P33	SDP-S-334	GEM-3033		3PS-P33
C6	330 10%		DM-330	DD-331	L10T39	CCD-331	GP330		10TS-T39
C8	1000		BYD-001	DD-102	BYA10D1	CCD-102	B-B2		58K-D00
C9	510		DK-500	DD-51	58ST51	CCD-501	GP500		10TS-T50
C7	1000		BYD-001	DD-102	BYA10D1	CCD-102	B-B2		58K-D00
C6	4.7 10%		NPO-8S 4.7	TCE-4S7	CUSV4C	CCD-4S7	CMO-S47		10TCC-Y47
C9	10		NPO-S1 10	TCE-10	CUSQC	CCD-100	CMO-S10		10TCC-Q20
C10	1000		BYD-002	DD-102	BYA10D1	CCD-102	B-B2		58K-D00
C11	.047 200V		P288N-047	DD-503	CUSB247	4DP-3-473	GEM-4147		37M-S47
C12	.047 200V		BYD-00	DD-503	BYA10S	CCD-053	B-B20		58K-S00
C13	33 NTS 10%					*			
C14	10		NPO-S1 10	TCE-10	C10QSC	CCD-100	CMO-S10	RCA-10TCC-Q20	10TCC-Q20
C15	68 NTS 10%					*			
C16	.1 200V		P288N-1	DF-104	CUSB2P1	4DP-3-104	GEM-3D1		37M-P10
C17	47		EI 47	DS-470	L10Q47	CCD-470	GP447		10TS-Q47
C18	33	8%	NPO-4S 3.0	TCE-3R3	C10V3C	CCD-3R3	CNO-S33		10TCC-Y33
C19	10000		BYD-01	DD-103	BYA10S1	CCD-103	B-B10		58K-S10
C20	1000		BYD-001	DD-102	BYA10D1	CCD-102	B-B2		58K-D00
C21	1000		BYD-01	DD-102	BYA10S1	CCD-102	B-B2		58K-S00
C22	1000		BYD-001	DD-102	BYA10D1	CCD-103	B-B20		58K-D00
C23	33 NTS 10%					*			
C24	.047 200V		P288N-047	DD-503	CUSB247	4DP-3-473	GEM-4147		37M-S47
C25	1000		BYD-01	DD-103	BYA10S	CCD-103	B-B10		58K-S10
C26	10000		BYD-01	DD-103	BYA10S	CCD-103	B-B10		58K-S10
C27	820		DS-820	DD-82	BYA10T82	CCD-821	B-B3		10TS-T82
C28	3000		BYD-002	DD-303	BYA10G3	CCD-303	B-B30		58K-D30
C29	.0039 400V 10%		P96NC39-0039		DPM83S9	5DP-1-392	GEM-4D39		5PS-D39
C30	1000 10%		DI-1000	DD-102	58S2S	CCD-102	GP100		10TS-D00
C31	.047 200V		P288N-047	DD-503	CUSB247	4DP-3-473	GEM-4147		37M-S47
C32	.047 300V 10%		V84C3S47-10%		P96S247	4DP-3-473	GEM-4S15		37M-S47
C33	10000 2000V						SEM-410		20EHS-S7
C34	100		SI 100	DS-101	L10T1	CCD-101	GP100		10TS-T00
C35	47		EI 47	DS-470	L10Q47	CCD-470	GP447		10TS-Q47
C36	1000		BYD-001	DD-102	BYA10D1	CCD-102	B-B2		58K-D00
C37	.0047 400V 10%		V84C047-10%		P96D247	4DP-1-472	GEM-4D47		37M-D47
C38	1000		BYD-001	DD-102	BYA10D1	CCD-103	B-B20		58K-D00
C39	300V		P288N-1	DF-104	CUSB2P1	4DP-3-104	GEM-3D1		37M-P10
C40	.0068 400V 10%		V84C68S-10%		P96D268	4DP-1-682	GEM-4E68		37M-D68
C41	330 10%		1469-00333		58ST33	CM-1H8-333-K	MC9S4L		MS-333
C42	680 10%		1469-00068		58ST68	CM-1H8-68-K	MC2S69		MS-S68
C43	10000	(470) †	BYD-01	DD-103	BYA10S	CCD-103	B-10		58K-S10
C44	.1 300V		P288N-1	DF-104	CUSB2P1	SDP-3-104	GEM-3D1		37M-P10
C45	.15 300V		P288N-15		P96S215	5DP-3-154	GEM-5D15		57M-P15
C46	.22 300V		P288N-22		CUSB2P2	5DP-3-224	GEM-5D22		57M-P22
C47	95 3000V .NI500 5%	(68-3000V)†							
C48	.22 300V		P288N-22		CUSB2P2	2DP-4-224	GEM-3D22		37M-P22
C49	56 3000V 10%				AVA20956	VCM-30-560K	3DY-456		
C50	1000		BYD-01	DD-103	BYA10S1	CCD-102	B-B10		58K-S10
C51	1000		BYD-001	DD-102	BYA10D1	CCD-102	B-B2		58K-D10
C52	10000 1600V		DAC-S7	DDE-103	AVE56S	SDP-3-103	DAC-10		BL-S3
C53	.33 400V		P488N-32		CUB4P32	4DP-5-334	GEM-4033		47M-P32

† Alternate Value. * Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	47KA	↓	800093	B-S5-S	A47-500K-2	Q13-153	TA55A	Volume
B	Shaft			Not Reg.	FB-3	Not Reg.	Not Reg.	Power Off-On
C	Switch			Not Reg.	SWC-13	Y5-1	US-2S	Contrast
R2	100KΩ	↓	800089	B-S05		Q17-108	US	Brightness
R3A	1 meg	↓	800080	B-S7	A47-1meg-S	Q1-141	TA55L	
B	Shaft			Not Reg.	FB-3	Not Reg.	Not Reg.	

PARTS LIST AND DESCRIPTIONS (cont)

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R4A	1. 5meg	↓	800091	B-T43	A47-1.5meg-S	Q1-138	TA55L	Vert. Hold
B	Shaft			Not Reg.	FB-3	Not Reg.	Not Reg.	
R5A	2meg	↓	803063	TT-75	B47-2meg-S	BU-159	PTA26L	Vert. Linearity
B	Shaft			Not Reg.	Not Reg.	Not Reg.	Not Reg.	
B	5meg	↓		TT-97 *	B47-5meg-S *	TM4	PTA56L *	Height
R6A	Tilt	↓	800092	TT-36	B47-100K-S	BU-155	PTA25L	Horiz. Hold
B	Shaft			Not Reg.	Not Reg.	TM4	Not Reg.	

* Use 1meg resistor in series with right hand terminal, viewed shaft end terminals down.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R7	22K	10K *
R8	150Ω	
R9	56Ω	
R10	150Ω	
R11	180Ω	
R12	1meg	
R13	680Ω	
R14	270K	2.7meg *
R15	680K	3.9meg *
R16	3300Ω 7W	Pt. #82448 (IRC # PW10-3300)
R17	120K	
R18	100K	
R19	33K	
R20	680K	
R21	270K	
R22	680K	
R23	680Ω	
R24	220Ω	

ITEM No.	RATING	REMARKS
R25	27K 2W	
R26	180Ω	
R27	15K	
R28	12K 1W	
R29	680Ω	
R30	12K	
R31	56K	
R32	100K	
R33	100K	
R34	470K	
R35	180K	
R36	150K	
R37	1.5meg	
R38	100K	
R39	680Ω	
R40	680Ω	
R41	220K	
R42	1meg	
R43	470Ω	

ITEM No.	RATING	REMARKS
R44	1meg	
R45	1meg	
R46	82K	
R47	12K	
R48	1200Ω	
R49	56K	
R50	33K	47K *
R51	39K	
R52	33900	
R53	390K	
R54	56K	47K *
R55	1200Ω 2W	
R56	6800Ω	
R57	27K	
R58	220Ω	
R59	2250Ω	
R60	4.7Ω ②	Pt. #830003 (IRC #PW4.7Ω)
R61	50Ω 15W	②

* Alternate Value. ① Fusible Type.
② Some versions may use 26Ω, 15W (Pt. #838004) in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	RCA PART No.	Rem PART No.	Stancor PART No.	NOTES
L1	1st Video IF	763038	TV-131	6236	VF-4	RTC-8526	
L2	2nd Video IF	763039					
L3	3rd Video IF	760025					
L4	RF Choke	760016	BC-563	4606		RTC-8517	2uh
L5	Shunt Peaking Coil		TV-190	6134	VP-7	RTC-8578	360uh
L6A	4.5MC Trap	763037	TV-137	1462		RTC-8568	
B	1st Sound IF						
L7	Shunt Peaking Coil	①	TV-197 *	6154 *	VF-8 *	RTC-8598 *	220uh
L8	Series Peaking Coil	①	TV-198 *	6120 *	VP-3 *	RTC-8575 *	150uh
L9	2nd Sound IF	763019					
L10	Quadrature Coil	774009	TV-121	1480		RTC-8605	
L11	RF Choke	②	RW-121	8125-22		RTC-8505	4.7uh

① Wound on 39000 Resistor. ② Wound on 27K Resistor. ③ IRC Part #CLA.
* Parallel with 39000 Resistor. * Parallel with 27K Resistor.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L12	Horiz. Stabilizer	760031	TV-183	6210	H-103	RC110	RTC-8623	HS-5	WLC-3

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ⁻¹/₀	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L23	.335A	15Ω	4 Hy.	734006			C-1343		C-37E	

TRANSFORMERS (SWEEP CIRCUITS)

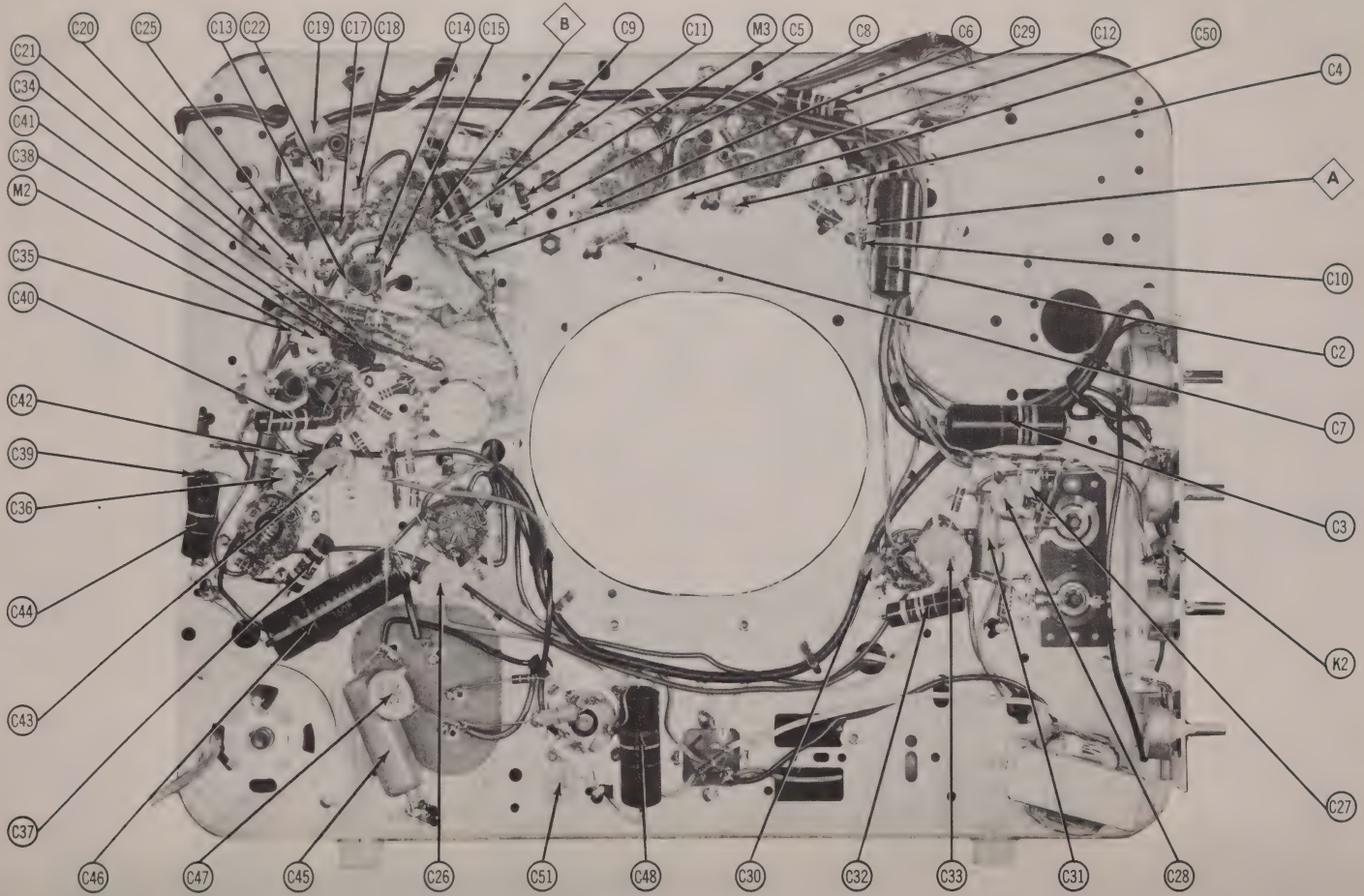
ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Merit PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	738011	A-3115 ①			VO-109 ①	26S75 ①	A-17X
T2	Yoke Horiz. 35MH 90° Vert. 38MH	760013	MDF-92 ②	Y90719/43Z ②	PCM3935 ②	DY-65A ②	T-48 ②	T-45 & VW19
	Rear Cover and Centering Device							YC-12
	Horiz. Output	728013	HVO-134 *	X-154 *		HO-197 *	FLY-146 *	D-154 *

① Drill new mounting hole(s); use 8 to 1 turns ratio.
② Use original rear cover, centering device and yoke damping network, if necessary.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R62	1meg	
R63	1meg	
R64	1meg	
R65	1meg	
R66	1meg	
R67	1meg	



CHASSIS BOTTOM VIEW - CAPACITOR, ALIGN., & MISC. IDENT.

TUNER ALIGNMENT INSTRUCTIONS

710031

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 .....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A204 thru A215 ..... None Required

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4.5 volt bias supply to point ⓘ. Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Use 10MC sweep unless otherwise noted.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point ⓘ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A205	
		201MC	199.25MC 203.75MC	11		A206	
		195MC	193.25MC 197.75MC	10		A207	
		189MC	187.25MC 191.75MC	9		A208	
		183MC	181.25MC 185.75MC	8		A209	
		177MC	175.25MC 179.75MC	7		A210	
		85MC	83.25MC 87.75MC	6		A211	
		79MC	77.25MC 81.75MC	5		A212	
		69MC	67.25MC 71.75MC	4		A213	
		63MC	61.25MC 65.75MC	3		A214	
		57MC	55.25MC 59.75MC	2		A215	

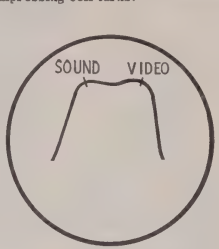


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

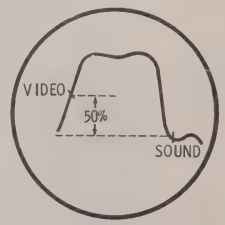
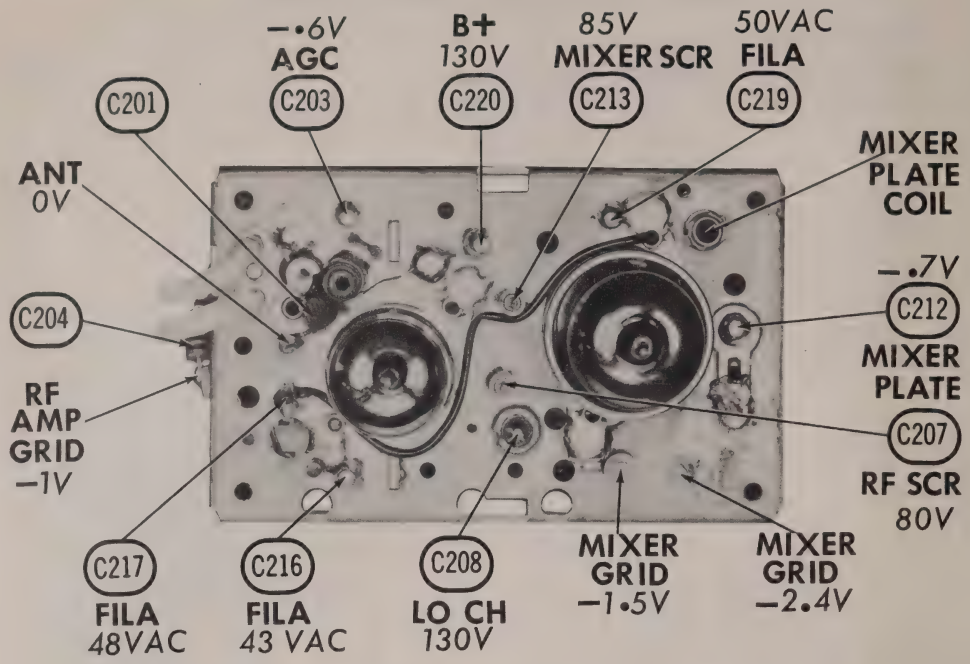
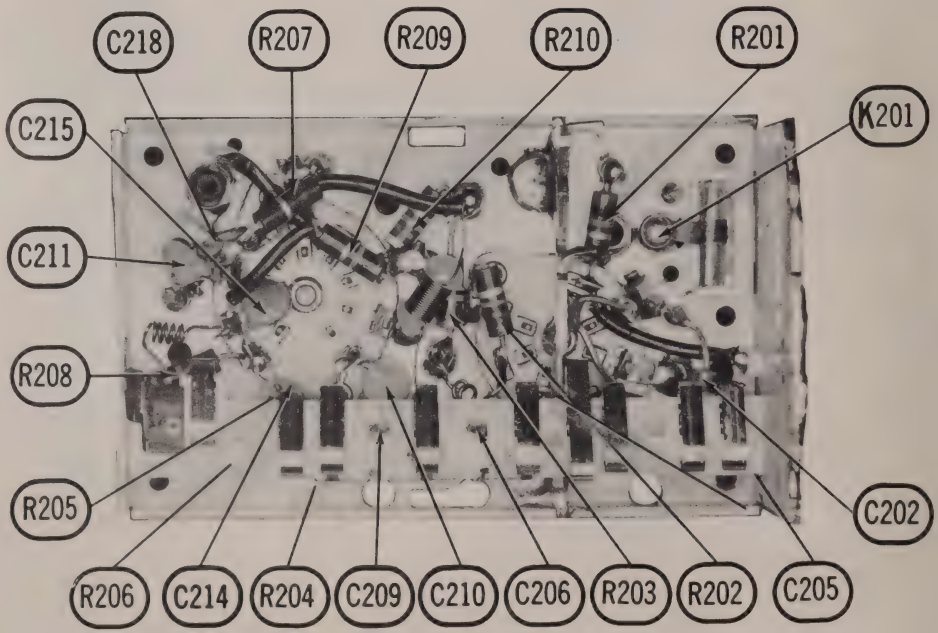


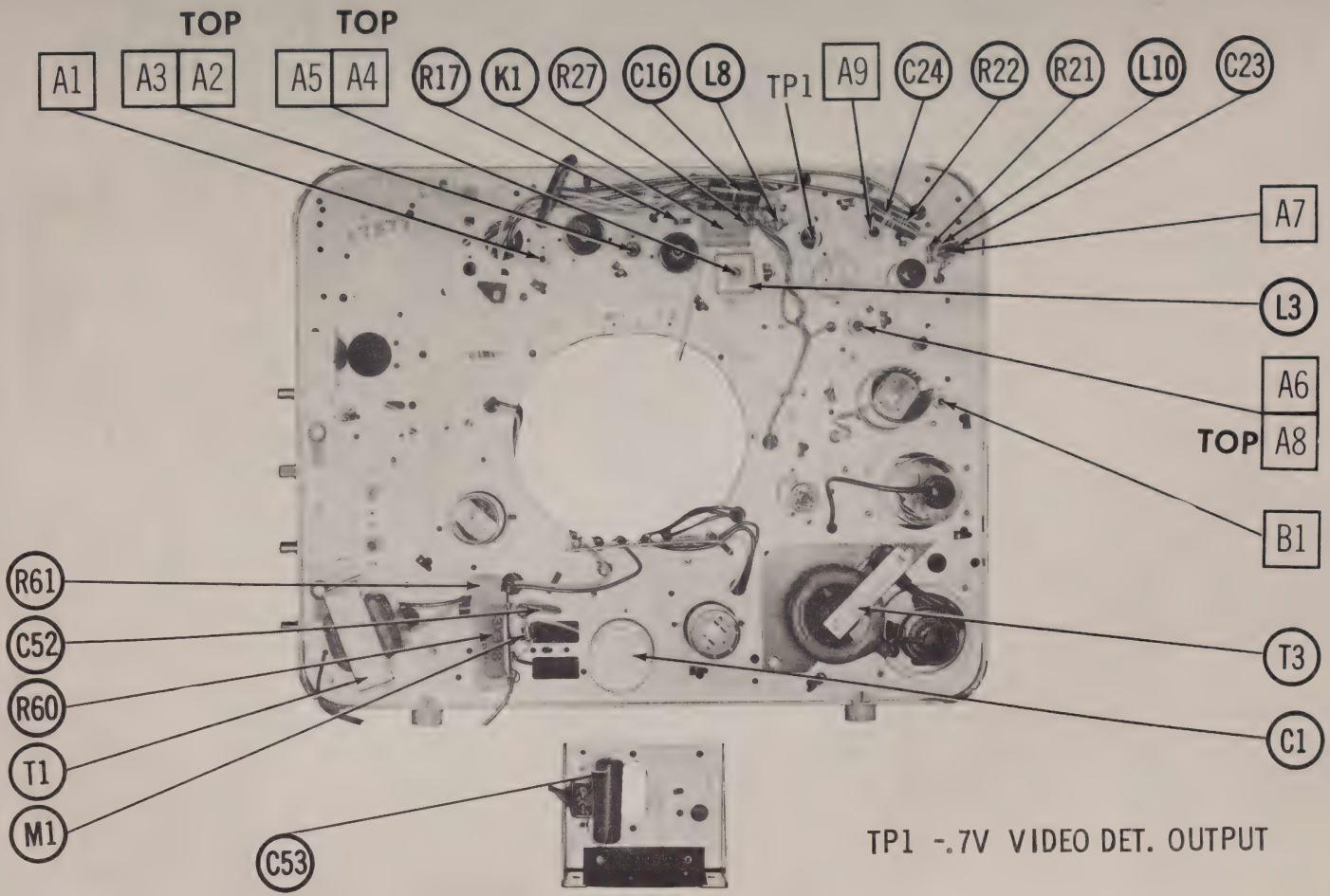
FIG.202



VHF TUNER with UHF Provisions - TOP VIEW



VHF TUNER with UHF Provisions - BOTTOM VIEW

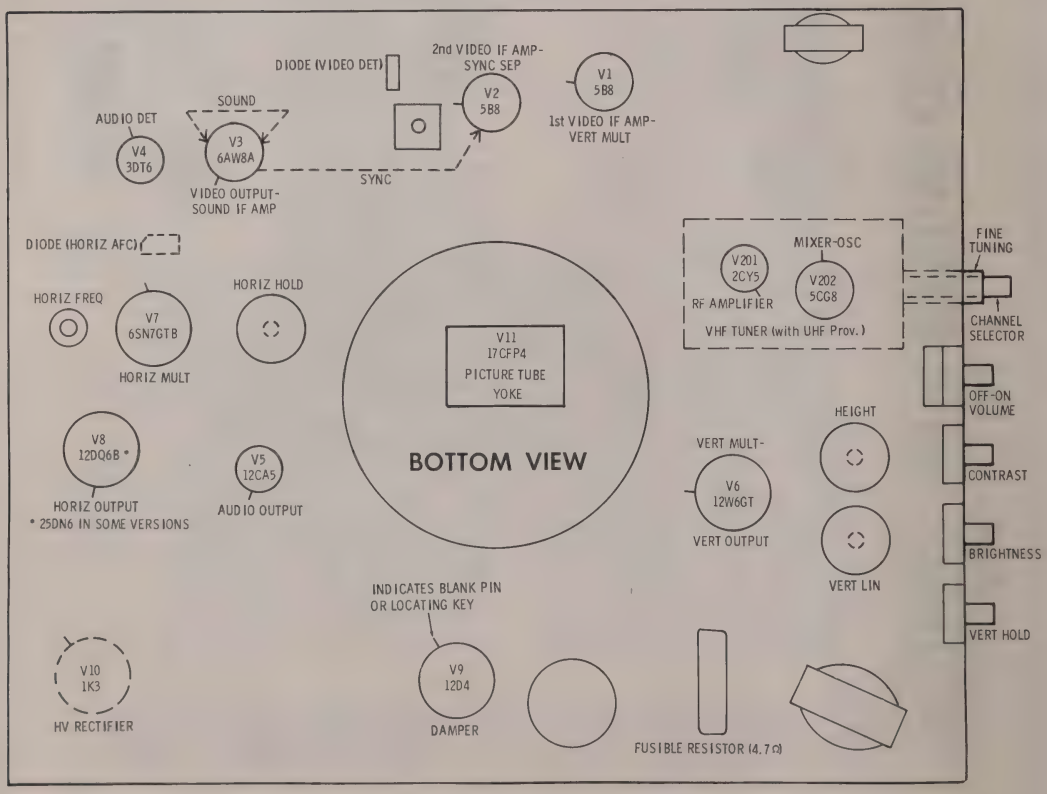


CHASSIS - TOP VIEW

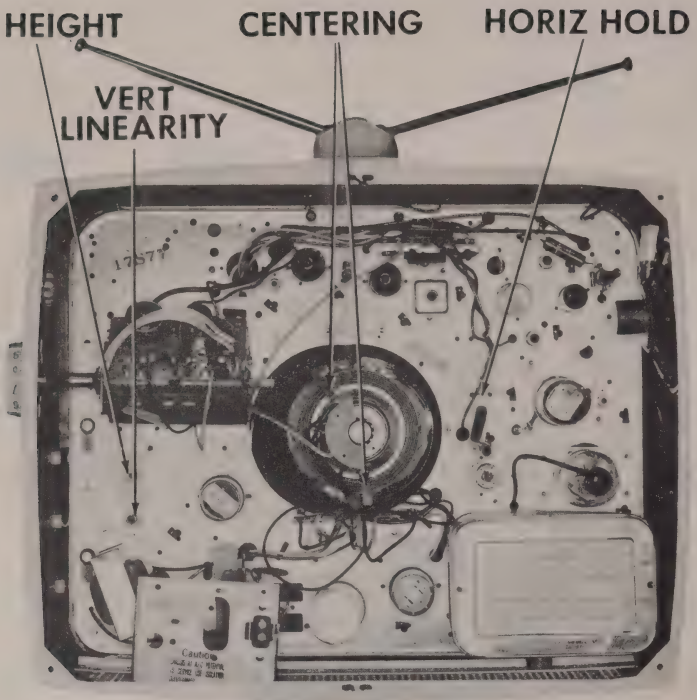
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5B8	0Ω	•1meg	•†2.2meg	60Ω	70Ω	1meg	56Ω	†165Ω	†165Ω
V2	5B8	0Ω	2.4meg	†12K	50Ω	60Ω	0Ω	180Ω	†165Ω	†165Ω
V3	6AW8A	0Ω	100K	†35K	40Ω	50Ω	•100Ω	220K	†15Ω	†3300Ω
V4	3DT6	4Ω	680Ω	40Ω	35Ω	‡710K	†2200Ω	680K		
V5	12CA5	120Ω	NC	125Ω	105Ω	0Ω	†2200Ω	†235Ω		
V6	12W6GT	TP	85Ω	†270Ω	†15Ω	•2.6meg	TP	105Ω	0Ω	
V7	6SN7GTB	3meg	†12K	1200Ω	•110K	†33K	1200Ω	25Ω	35Ω	
V8	12DQ6B	TP	125Ω	TP	†1200Ω	450K	TP	145Ω	0Ω	TOP CAP †12Ω
V9	12D4	NC	TP	¶	NC	†15Ω	NC	0Ω	15Ω	
V10	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †445Ω
V11	17CFP4	15Ω	12Ω	Pin 6 ‡27K	Pin 10 ‡27K	Pin 11 •200K	Pin 12 25Ω			
V201	2CY5	1meg	0Ω	80Ω	85Ω	†235Ω	†10K	0Ω		
V202	5CG8	15K	†57K	0Ω	80Ω	70Ω	†2400Ω	†47K	0Ω	240K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V9.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold to the center of its range.

Tune in a TV station and adjust the Horizontal Frequency Slug (B1) until the picture synchronizes horizontally.

Proper adjustment is indicated when it is possible to switch from one channel to another without the picture losing sync.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 metal screws holding rear cover. Remove rear cover.
2. Remove 6 push-on type knobs at side of cabinet.
3. Remove speaker leads, high voltage lead, picture tube socket, yoke, and ground lead from picture tube to chassis. Unsolder isolation unit from cabinet.
4. Remove 2 screws holding AC plug (at bottom of cabinet). Remove 4 chassis bolts (2 at top and 2 at bottom).
5. Remove chassis.

PICTURE TUBE REMOVAL

1. Remove rear cover.
2. Remove picture tube socket and yoke.
3. Remove 2 screws on each side and one at bottom, holding front escutcheon (cabinet front).
4. Pull escutcheon out part way and disconnect HV lead and picture tube mounting bracket ground wire.
5. Remove escutcheon (contains picture tube and mounting assembly).

PHOTOFACT® Folder with CIRCUITRACE®

ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583

MODEL E2010C (CH. 16E25Q)

ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 507 FOLDER 2

MODEL E2010C (CH. 16E25Q)

TRADE NAME	ZENITH	MODELS	CHASSIS
		E1810B, E1811C, E1812L, E1814P	16E25
		E1810BU, E1811CU, E1812LU, E1814PU	16E25U
		E2010C, E2015L (With Remote Control Receiver S-48583)	16E25Q
MANUFACTURER	Zenith Radio Corporation, 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver (Models E2010C & E2015L with Remote Control)		
TUBES	TV: VHF - Sixteen, UHF - Seventeen Remote Control Receiver: Six		
POWER SUPPLY	110-120 Volts AC, 60 Cycles		
RATING	VHF: 250 Watts, 2.4 Amp. @ 117 Volts AC (With Remote, While Tuning)		
	VHF: 225 Watts, 2 Amp. @ 117 Volts AC (With Remote, Not Tuning)		
	VHF: 190 Watts, 1.7 Amp. @ 117 Volts AC (TV Only)		
TUNING RANGE	Channels 2 thru 13 VHF; 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

FOR SERVICE INFORMATION ON VHF TUNER 175-151 (ELECT. SAME AS 175-131), AND UHF TUNER 175-8 - SEE PHOTOFACT SET 493 FOLDER 2.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

It is necessary to remove chassis (with picture tube) for safety glass removal and cleaning. See "Chassis Removal", Page 24.

FUSE

TV: A .7A S/B fuse is used for low voltage supply protection. (For location, see "Tube Placement Chart".)

A fuse wire is used for filament protection. (For location, see M3 in photo "TV Chassis -Bottom View".)

Remote Control Receiver: A 3/4A S/B fuse is used for receiver protection. (For location, see M8 in photo "Receiver Chassis - Top View".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

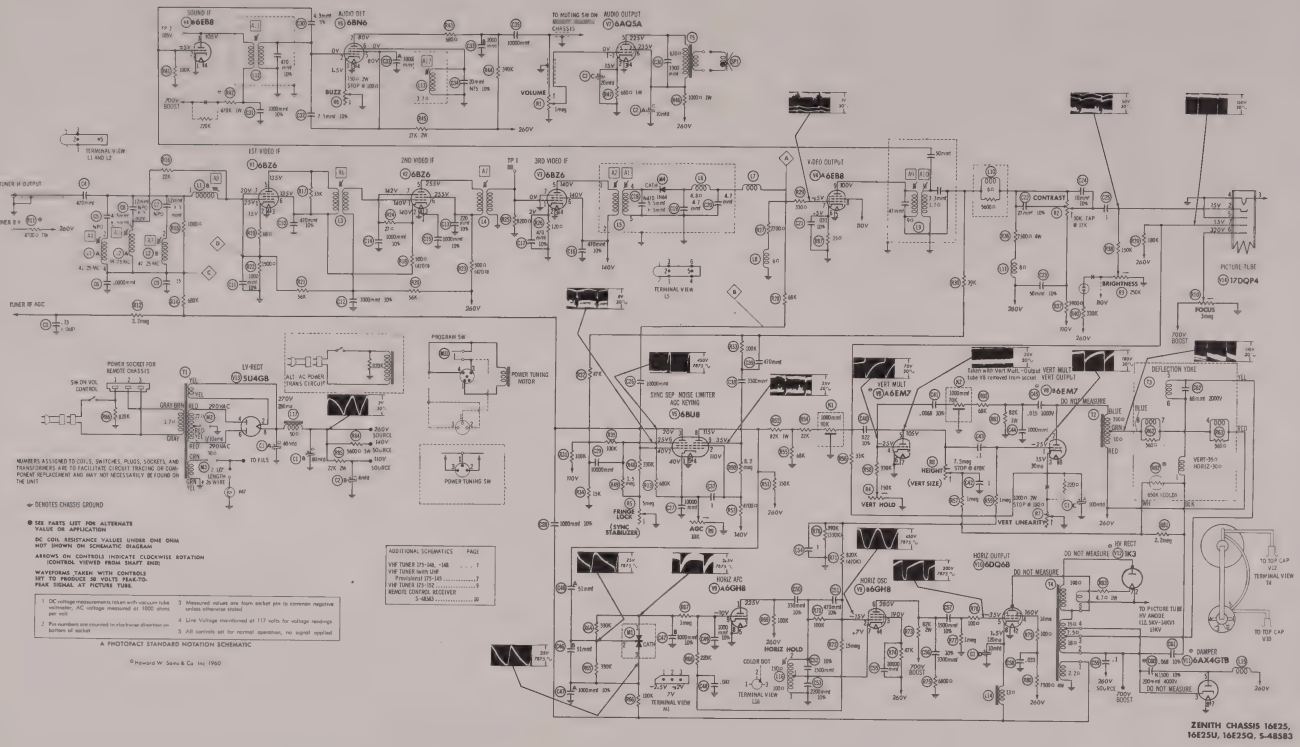
ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583

ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583

SET 507 FOLDER 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

DENOTES CHASSIS GROUND

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

ADDITIONAL SCHEMATICS

	PAGE
VHF TUNER 175-186, 188	7
VHF TUNER (with UHF Provision) 175-160	7
VHF TUNER 175-152	9
REMOTE CONTROL RECEIVER S-48583	30

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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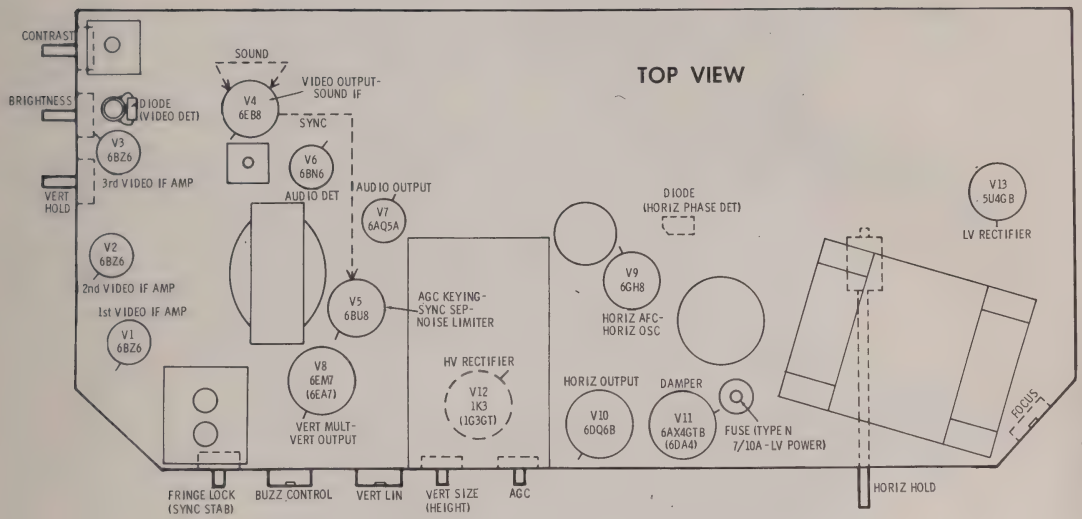
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (LV Power), V13

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Diode (Phase Det.), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V8, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to TP-1. Low side to chassis.	44.0MC (10MC Swp)	39.75MC 41.25MC 45.75MC	Between two channels	Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load)	A1, A2	Set sweep output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, see that the cores are entering their respective windings from opposite ends.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5	Connect a clip lead from point (B) to chassis. Connect a clip lead from point (C) to point (D). Use high scope gain and adjust A3 thru A5 for MINIMUM amplitudes at markers as shown in Fig. 2. A3 controls 39.75MC, A4 controls 41.25MC and A5 controls 47.25MC.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8, & Mixer Plate Coil	Disconnect the clip lead from point (D) and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A6 affects the low frequency side and A7 affects the high frequency side.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver terminals.
Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the Audio Detector as evidenced by a hiss similar to super-regeneration in the sound. Adjust A9, A10, A11 and A12 for maximum sound and best quality. Adjust the Buzz control for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

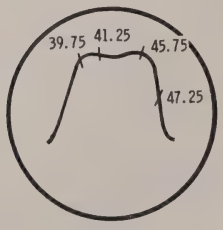


FIG.1

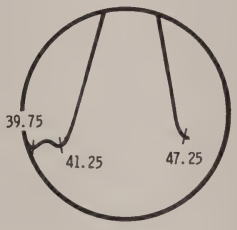


FIG.2

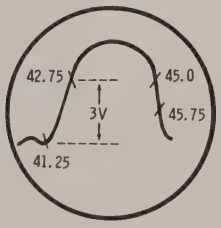
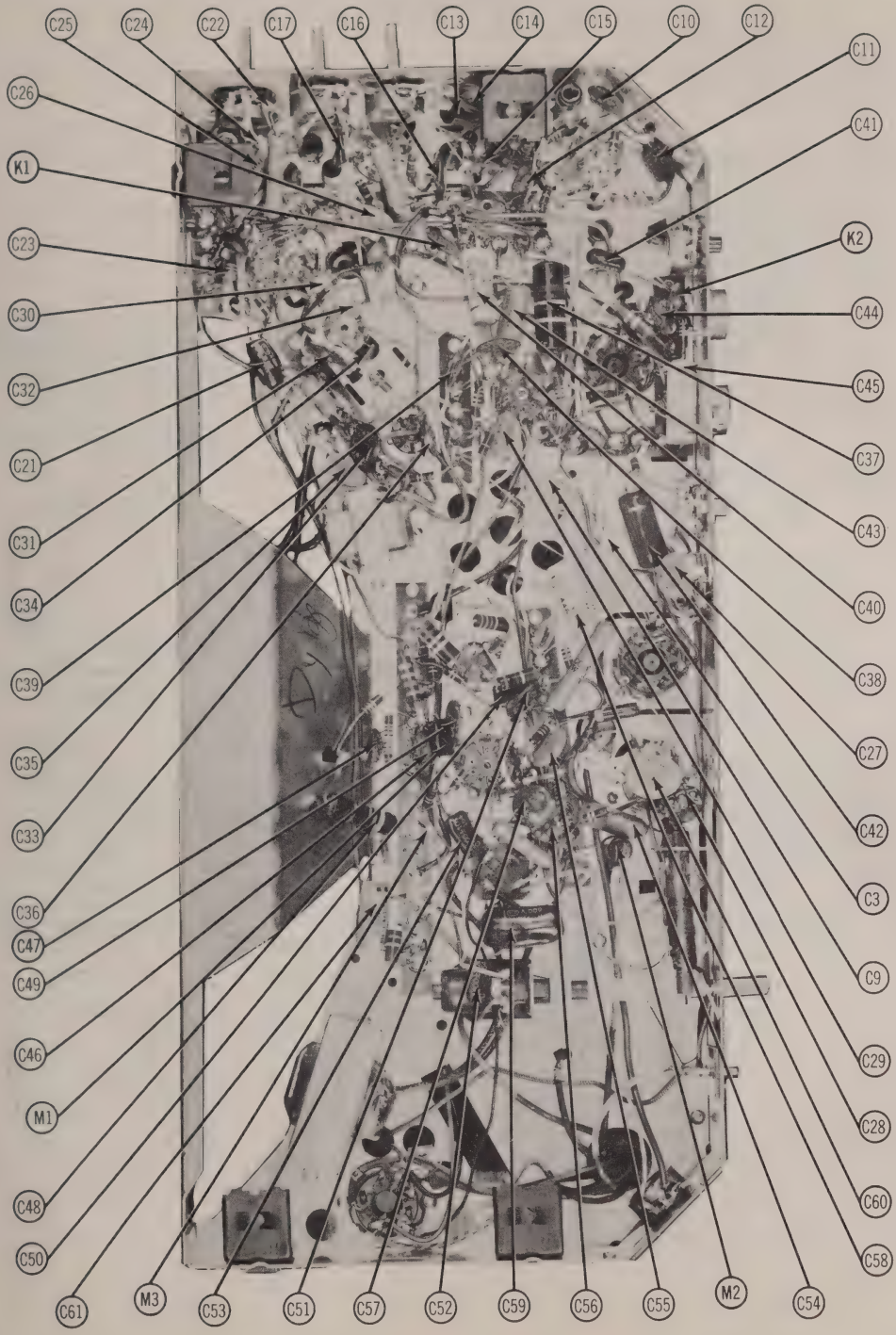


FIG.3

TUNER ALIGNMENT INSTRUCTIONS PAGES 6 & 8



TV CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

SET 507 FOLDER 2

TUNER ALIGNMENT INSTRUCTIONS
175-145,-146,-148

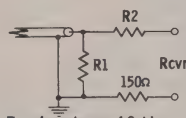
PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A216 thru A227 ... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching Network (Fig. 201).	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point ⓓ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	



Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG.201

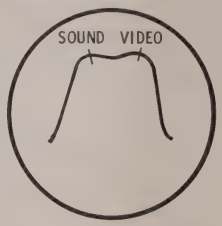


FIG.202

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Fig. 201	Across antenna terminals thru matching Network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

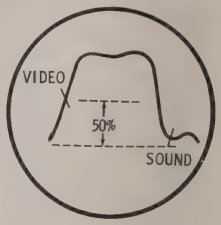
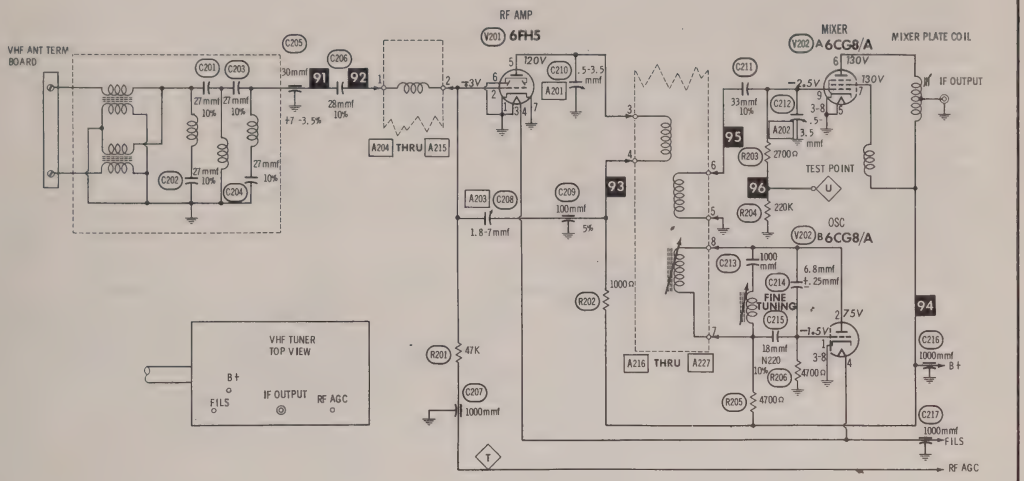


FIG.203



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with CIRCUITRACE

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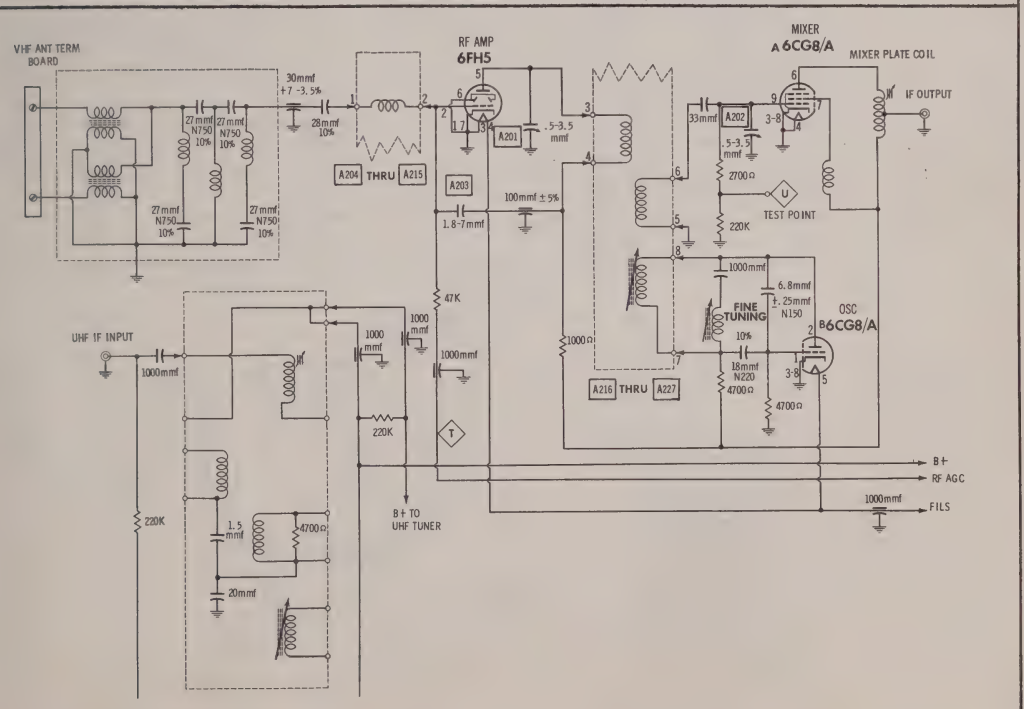
VHF TUNER 175-146, 175-148



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VHF TUNER with UHF Provisions - 175-145

SET 507 FOLDER 2

TUNER ALIGNMENT INSTRUCTIONS

175-152

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

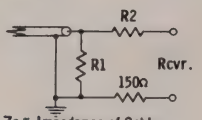
VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range by turning the Fine Tuning shaft until the small index hole in the drive cam is directly over the small hole just below the channel 13 oscillator adjustment screw. Starting with the highest channel operating in the area, adjust the appropriate oscillator adjustment screw for best picture and sound for each channel available.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point ①. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usuable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. amp. thru 10K to point ①. Low side to chassis.	A201	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown.
2.	"	"	207MC	205.25MC 209.75MC	12	"	A202	"
3.	"	"	201MC	199.25MC 203.75MC	11	"	A203	"
4.	"	"	195MC	193.25MC 197.75MC	10	"	A204	"
5.	"	"	189MC	187.25MC 191.75MC	9	"	A205	"
6.	"	"	183MC	181.25MC 185.75MC	8	"	A206	"
7.	"	"	177MC	175.25MC 179.75MC	7	"	A207	"
8.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust first coil for proper marker position and second coil for maximum gain and symmetry.
9.	"	"	79MC	77.25MC 81.75MC	5	"	A210, A211	"
10.	"	"	69MC	67.25MC 71.75MC	4	"	A212, A213	"
11.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215	"
12.	"	"	57MC	55.25MC 59.75MC	2	"	A216, A217	"



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

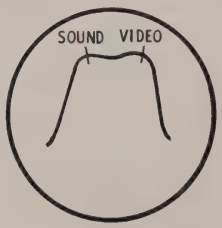
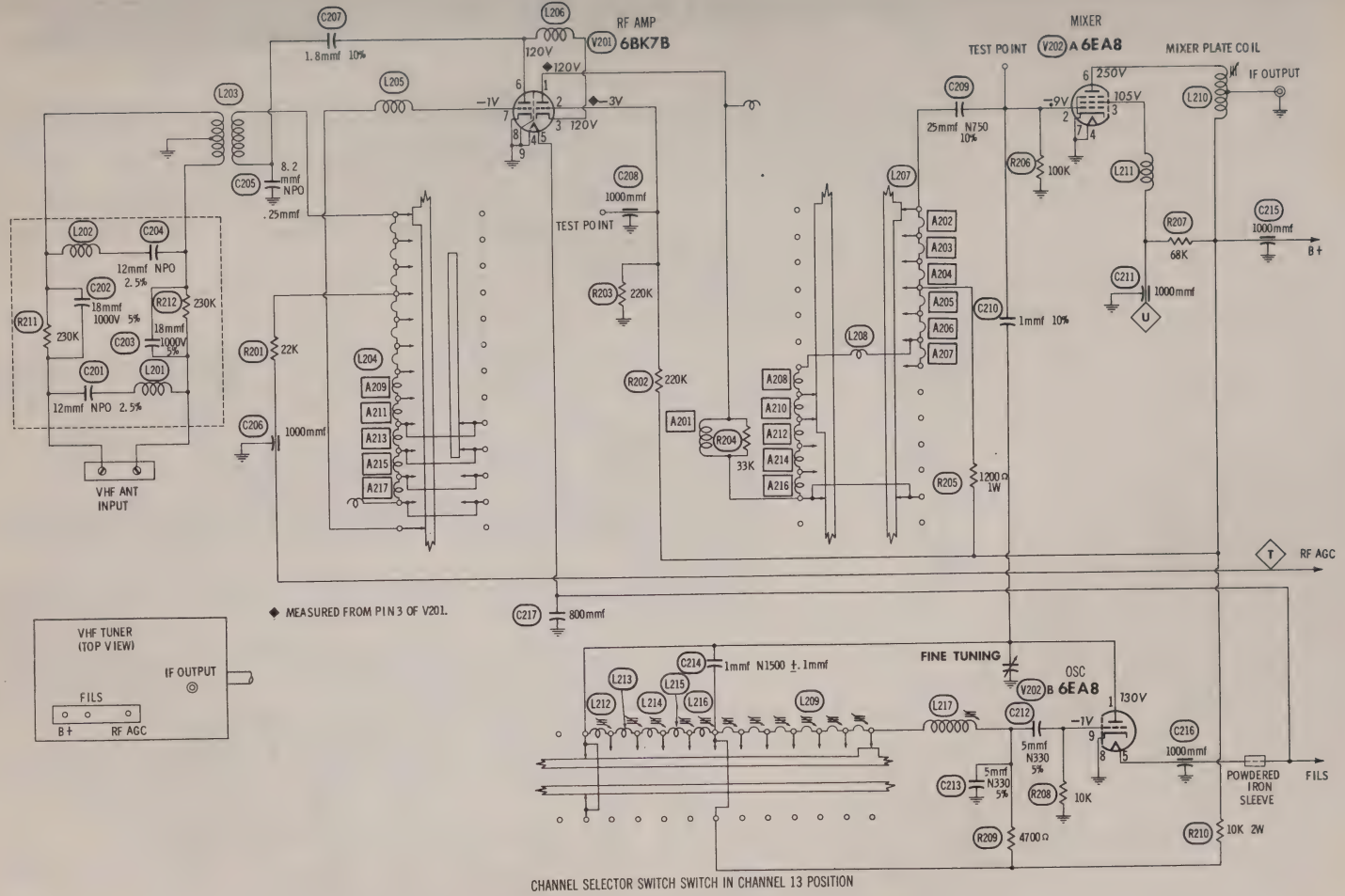


FIG. 202



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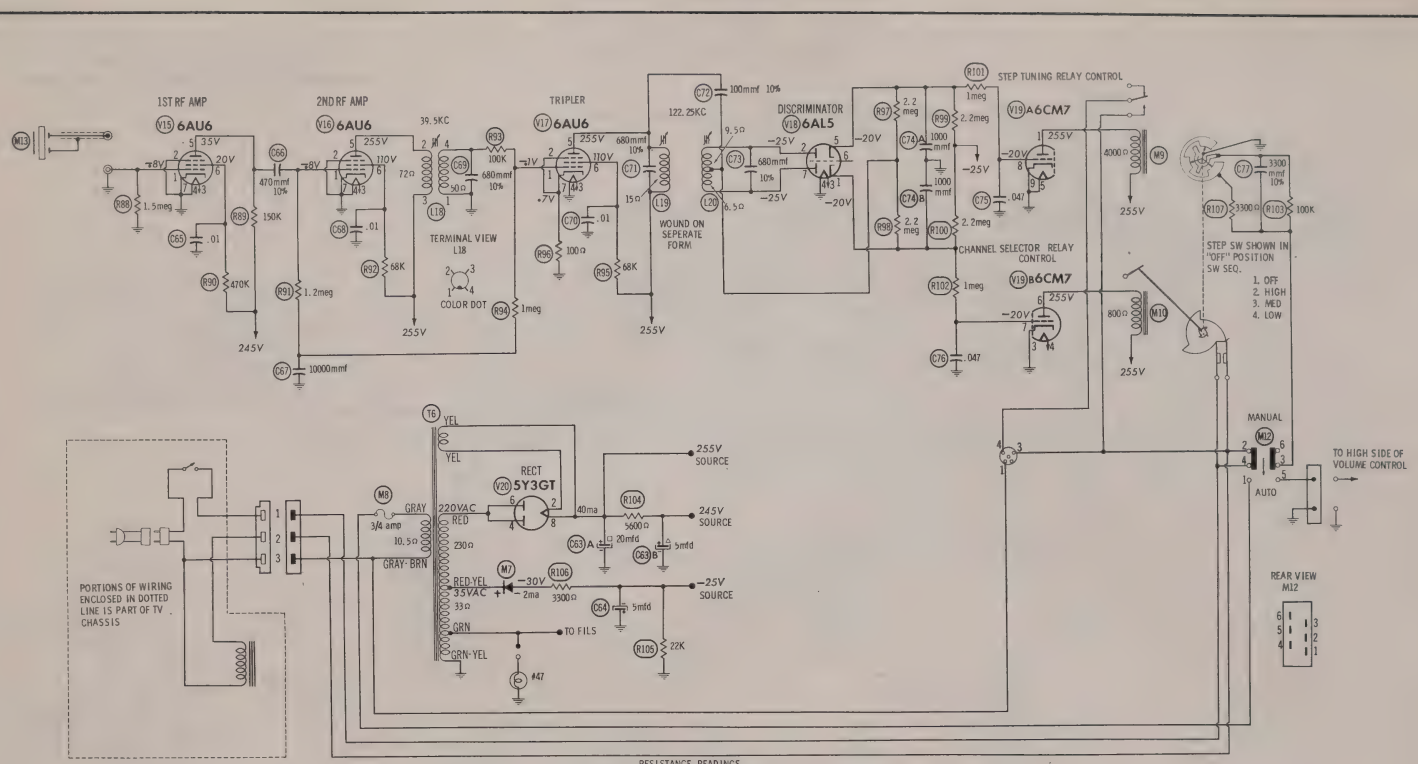
VHF TUNER 175-152

ZENITH CHASSIS 16E25, 16E25U, 16E25Q, S-48583



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V15	6AU6	1.5meg	0Ω	.1Ω	0Ω	††155K	††475K	0Ω		
V16	6AU6	2.3meg	0Ω	.1Ω	0Ω	††70Ω	††68K	0Ω		
V17	6AU6	100K	100Ω	.1Ω	0Ω	†† 15Ω	††68K	100Ω		
V18	6AL5	2.2meg	2.2meg	.1Ω	0Ω	2.2meg	NC	2.2meg		
V19	6CM7	††4000Ω	TP	0Ω	.1Ω	0Ω	††800Ω	3.2meg	3.2meg	0Ω
V20	5Y3GT	NC	¶	NC	263Ω	NC	263Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V20.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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REMOTE CONTROL RECEIVER S-48583

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Output	6AQ5A
V2	2nd Video IF Amp.	6BZ6	V8	Vert. Mult. - Vert. Output	6EM7 (6EA7) *
V3	3rd Video IF Amp.	6BZ6	V9	Horiz. AFC - Horiz. Osc.	6GH8
V4	Video Output - Sound IF Amp.	6EB8	V10	Horiz. Output	6DQ6B
V5	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V11	Damper	6AX4GTB (6DA4) *
V6	Audio Det.	6BN6	V12	HV Rectifier	1K3 (1G3GT) *
			V13	LV Rectifier	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	17DQP4				17DQP4 ①	① Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	22-3212	AFH4-100-40	D0477.5	FP454.8	TMT-3510 TD-40-450	TVL-4663.4	
B	◣80	400							
C	▲100	50							
D	10	25							
C2A	■10	400	22-2744	AFH3-180	C1445	FP368.68	TMT-3459	TVL-3655	
B	▲4	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.15	200V		(.068) †	P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C4	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C5	4.5	NPO	±.5mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C6	10000				BPD-01	DD-103	BYA10S1	CCD-102	B-110	5HK-S10
C7	12	NPO	±.5mmf			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C8	12	NPO	±.5mmf			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C9	.15	200V			P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C10	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C11	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C12	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C13	220		10%		1469-00022	TCZ-220	5R5422	CM-19B-221K	CNO-322	MS-322
C14	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C15	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C16	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C17	470		10%		1469-00047		5R5T47	CCD-471 *	GP347	MS-347
C18	5.5	N470	±.5mmf	Pt. #22-3221						
C19	4.7				NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C20	4.7				NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C21	.033	200V	10%		V84C2S33-10%		PM4S33	4DP-2-333	GEM-4133	6TM-S33
C22	27		10%		NPO-SI 27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C23	50		10%		NPO-SI 50	TCZ-50	C10Q50C	CCTO-510	CNO-450	10TCC-Q50
C24	10		10%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C25	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C26	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C29	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	4.3		5%				C10V4C			10TCC-V39
C31	1000		10%		DI-1000	DD-103	PM6D1	CCD-102	GP210	10TS-D10
C32	7.5		10%				C10V8C			
C33A	1000							CCD-102		
B	1000				BPD-2X001	DD3-102	BYD6DD1	CCD-102 *	B2X210	5HK-2XD10
C34	20	N75	10%	Pt. #22-3139						
C35	10000				BPD-01	DD-102	BYA10S1	CCD-103	B-110	5HK-S10
C36	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-332	5HK-D33
C37	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C38	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-332	5HK-D33
C39	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C40	.022	400V	10%		V84C4S22-10%		PM4S22	4DP-2-223	GEM-16122	4TM-S22
C41	.0068	200V	10%		V84C2S68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C42	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C43	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C44	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	.015	1000V			P1088N-015	DD16-153	CUB10S15	16DP-4-153	GEM-10115	10TS-S15
C46A	51				DI-50	DD-510	L10Q51	CCD-500	GP450	10TS-Q50
B	51				DI-50	DD-510	L10Q51	CCD-500	GP450	10TS-Q50
C47A	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
B	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C48	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C49	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C50	330		10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C51	470		10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C52	1500		10%		1464-0015		5R5D15	CM-19B-152K	MCB456	MS-215
C53	2200		10%		1464-0022		1R5D22	CM-19B-222K	MCJ459	MS-D22
C54	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C55	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA				
				ARROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C56	3300	10%		UU-3300	PM6DX	CCD-332	JL-333	1GT-D33
C57	1500	10%		UU-1500	DD-152	FM6DX	CCD-152	GP222	10TE-D15
C58	.033	400V		349BN-.033	DD-303	CU6B333	4DP-S-333	GEM-4133	9TH-S33
C59	.1	600V		249BH-1	DF-104	CU6B2P1	6DP-S-104	GEM-601	6TH-P10
C60	300	4000V ±5500 10%	Note 1						
C61	500	500V 10%		Y5HCS6S6-(05)		PM6S6G	6DP-E-502		6TM-S6S
C62	68	2000V		HVD30-68	DD30-680	CU6A2Q68	6DP-S-680	3DY-688	30GA-Q68

† Alternate Value.

Note 1. Alternate Value 330mmf @ 4KV (Pt. #23-224).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.		
R1A	Dual Sweep		53-4093	APL-697	C47E-1meg-B	311-137	FP181,		Volume
B	Shaft			AE-5	RS-3/16	Not Req.	DS-37		
C	Switch			Not Req.	Not Req.	83K3	Not Req.		Push-Pull Off-On
R2A	30K		53-4483				Not Req.		Contrast
	17K Tap						UT-453		
B	Shaft						DS-37		
R3A	250K		53-4492	AB-50	A47-250E-B	311-130	U48		Brightness
B	Shaft			AE-5	RS-3/16	83K3	DS-37		
R4A	750K		53-4491	AB-66	A47-750K-B	311-136	U54		Vert. Hold
B	Shaft			AE-5	RS-3/16	83K3	DS-37		
R5A	5meg		53-4050	T7-67	B47-5meg-S	311-141	FTA5S1,		Fringe Lock (Sync Stab.)
B	Shaft			Not Req.	Not Req.	T464	Not Req.		
R6	750Ω	2; WW	53-3254		39-800 *	112-800 *	FL-750 *		Buzz
	1000 Ohms								
R7	1000Ω	2; WW	53-4488		39-1000 **	112-1000 **	FL-1K **		Vert. Linearity
	1800 Ohms								
R8	7.5meg		53-4647	T7-90 †	B47-7.5meg-A	RLC8 †	SU-89 †		Vert. Size (Height)
	470K Ohms								
R8A	10K		53-4095	T7-44	B47-10K-S	311-128	TA14L		AGC
B	Shaft			Not Req.	Not Req.	T464	Not Req.		
R10	3meg		53-4456	T7-94	B47-3meg-S	RLC12	SU-89		Focus

* Use 100Ω Resistor in series with terminal. ** Use 180Ω Resistor in series with terminal.
† Use 470K Resistor in series with left hand terminal, viewed shaft end terminals down.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R11	*4700Ω 7W	Pt. #63-4686 (IRC #PW9-4700Ω)
R12	2.2meg	
R13	680K	
R14	680K	
R15	1000Ω	
R16	22K	
R17	33K	
R18	560Ω	(470Ω) ①
R19	68Ω	
R20	56K	
R21	56K	
R22	1500Ω	
R23	500Ω	(470Ω) ①
R24	27Ω	
R25	2200Ω	
R26	120Ω	
R27	2700Ω	
R28	68K	
R29	330Ω	
R30	39K	
R31	100K	
R32	47K	
R33	100K	
R34	18K	
R35	100K	
R36	7500Ω 4W	Pt. #63-4055 (IRC #PW5-7500Ω)

ITEM No.	RATING	REMARKS
R37	3300Ω	
R38	150K	
R39	180K	
R40	330K	
R41	100K	
R42	470K 1W	③
R43	680Ω	
R44	390K	
R45	27K 2W	
R46	1000Ω 1W	
R47	680Ω 1W	
R48	330K	
R49	1.5meg	
R50	8.2meg	
R51	150K	
R52	82K 1W	
R53	4700Ω	
R54	22K	
R55	68K	
R56	33K	
R57	1meg	
R58	330K	
R59	1meg	
R60	68K	
R61	82K 1W	
R62	560Ω	
R63	560Ω	
R64	330K	

ITEM No.	RATING	REMARKS
R65	330K	
R66	100K	
R67	1meg	
R68	220K	
R69	100K	
R70	100K	
R71	820K	(470K) ①
R72	1meg	
R73	82K 2W	
R74	47K	
R75	8200Ω	
R76	390K	(330K) ①
R77	1meg	
R78	100Ω	
R79	100Ω	
R80	7500Ω 4W	Pt. #63-4055 (IRC #PW5-7500Ω)
R81	3.3meg	
R82	6562Ω (Calc)	Pt. #63-4668 ②
R83	6.7Ω 1W	
R84	5600Ω 3W	Pt. #63-4427 (IRC #PW3-5600Ω)
R85	22K 2W	
R86	820K	
R87	15Ω	

① Alternate Value.
② Some versions may use two 230K Resistors (in series) in this application.
③ Part of T2.

*680Ω 2W when Tuner #175-152 is used.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator	1000mmf, 90K	57-5	Sprague V-13
K2	Vert. Feedback	1000mmf, 70K	57-1	Sprague V-14

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1A	41.25MC Trap	S-48045 ①					
B	1st Video IF						
L2A	39.75MC Trap	S-41893					
B	47.25MC Trap						
L3	2nd Video IF	S-43974	TV-130 ▲	6234 ▲	VP-3 ▲	RTC-8555 ▲	
L4	3rd Video IF	S-45539	TV-130 ▲	6234 ▲	VP-3 ▲	RTC-8555 ▲	
L5	4th Video IF	S-47968 ②					
L6	Series Peaking	S-41879	TV-181	6177	VP-3	RTC-8594	90uh
L7	RF Choke	S-21888	BC-595	4602		RTC-8530	6uh

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L8	Shunt Peaking	S-41619	TV-184	6180	VP-3	RTC-8597 *	170uh
L8A	4.5MC Trap	S-42872 ③	TV-130	1482		RTC-9098	
B	1st Sound IF						
L10	Series Peaking	S-43818 ④	TV-184 *	6180 *	VP-3 *	RTC-8597 *	170uh
L11	Shunt Peaking	S-41601	TV-185	6181	VP-5	RTC-8598	250uh
L12	2nd Sound IF	S-23347 ⑤	TV-113 ▲	6203 ▲	SF-2 ▲	RTC-8545 ▲	
L13	Quadrature Coil	S-45229	TV-121	1480		RTC-8609	
L14	Cathode Choke	S-48193					31MH
L15	RF Choke	S-21777	BC-596	4613		RTC-8532	10uh

① Complete Assembly Pt. #85-8046.
② Complete Assembly Pt. #85-8047.
③ Complete Assembly Pt. #85-8895.
④ Wound on 56000 Resistor.
⑤ Complete Assembly Pt. #85-8896.
▲ Drill new mounting hole.
* Parallel with 56000 Resistor.
● Use Adaptor Plate.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						
		ZENITH PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	Horiz. Osc. Coil	S-47150					RS-6		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	ZENITH PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L17	.280A	50Ω	1.5 Hy.	95-1663			C-2343	25C44	C-35X	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2		ZENITH PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V	580VCT @ 1.7A ② 280A DC	5V @ 3A		95-1067					R-80BA	
	SEC. 3	SEC. 4	SEC. 5								
	6.3V @ 7.5A										

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		ZENITH PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	95-1700	A-3884	V-316 ①②	VO-38 ①	VO-100 ②	26S73	A-134X	
T3	Yoke Horiz. (15.6MH)	95-1721							
	10H Vert. (30MH) Rear Cover and Centering Device	S-48191 ③							
T4	Horiz. Output	S-48197							

① Drill new mounting hole(s).
② Cut and tape blanking lead.
③ Part of T2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	5400Ω	3-4Ω	95-1665	A-3036 ①		A-3877 ①	26S48 ①	S-8Z	① Drill new mounting holes

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-867	4A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M3	105-30 *		60C1 *				* Dual Selenium Diode

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE + HOLDER	HOLDER	FUSE	HOLDER	
M2	3AG	7/10A 125V S/B	126-36	83-31	333, 760 (3AG 7/10A 125V S/B)	340010	N 7/10	HN 1/2 to 3/4	
M3	21" length of #26 wire								

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1N54	103-23 *	1N54	1N54	Video Detector * Included with L5 Assembly (Pt. #6-47967)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	175-148	VHF, STANDARD COIL REPLACEMENT 6GC-6330A, Used in Models E20UC and E20U51.
	Tuner	175-152	VHF, Used in Models E1820B and E1821C
	Tuner	175-146	VHF, Used in Models E1821L and E1824P
	Tuner	175-151	VHF with UHF Provisions, Used in Models E1820BU and E1821CU
	Tuner	175-149	VHF with UHF Provisions, Used in Models E1824PU and E1821LU
	Tuner	175-8	UHF, Used in Models E1820BU, E1821CU, E1824LU, E1824PU
	Antenna	846709	JFD REPLACEMENT #TA-373, Model E2010C JFD REPLACEMENT #TA-390, Models E2015L, E1824P, PU, E1821L, LU, E1821C, CU, E1820B, BU
M6	Motor Drive Ass'y	S-43732	Includes Motor Switch Ass'y (Part #6-45498) and Motor (Part #41-153)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	192-180	
Knob	46-3373	VHF Channel Selector, Models E1820B, E1820BU
Knob	46-3341	VHF Channel Selector, Models E1821C, E1821CU, E1821L, E1821LU, E2015L
Knob	46-3344	VHF Channel Selector, Models E1824P, E1824PU, E2010C
Knob	46-43927	UHF Channel Selector
Knob	46-44420	Fine Tuning
Knob	46-45758	Volume
Knob	46-44605	Brightness, Contrast, Vertical Hold
Knob	46-44325	Horizontal Hold
Cabinet	16-3874	Model E1820B
Cabinet	16-3878	Model E1820BU
Cabinet	16-3879	Model E1821CU
Cabinet	16-3875	Model E1821C
Cabinet	16-3738	Model E1821LU
Cabinet	16-3686	Model E1821L
Cabinet	16-3877	Model E1824PU
Cabinet	16-3873	Model E1824P
Cabinet	16-3116	Model E2010C
Cabinet	16-3873	Model E2015L

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8465 (Round) - 5 Conductor 8466 (Round) - 8 Conductor

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC ● RAYTHEON ● SYLVANIA ▲		ITEM No.		
	USE	TYPE		USE	TYPE
V15	1st RF Amp.	6AU6	V19	Step Tuning Relay Control - Channel Selector Relay Control	6CM7 5Y3GT
V16	2nd RF Amp.	6AU6			
V17	Tripler	6AU6			
V18	Discriminator	6AL5	V20	Rectifier	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	ARROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C83A B C84	20 15 5	350 350 50	23-2306	20S350 PSR350	BS350 BSR5-50	FP53L 3 TC50	TMD-2375 TD-5-50	TVL-2760 TVA-1303	

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C65	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C66	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C67	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C69	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C70	.01 400V		P488N-01	D6-104	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C71	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C72	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-31
C73	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C74A	1000		BPD-2X001	DD3-102	BYD6DD1	CCD-102	B2X210	5HK-2XD10
B	1000					CCD-102		
C75	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C76	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C77	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R88	1.5meg	
R89	150K	
R90	470K	
R91	1.2meg	
R92	68K	
R93	100K	
R94	1meg	

ITEM No.	RATING	REMARKS
R95	68K	
R96	100Ω	
R97	2.2meg	
R98	2.2meg	
R99	2.2meg	
R100	2.2meg	
R101	1meg	

ITEM No.	RATING	REMARKS
R102	1meg	
R103	100K	
R104	5600Ω	
R105	22K	
R106	3300Ω	
R107	3300Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L18	39.5KC Trans.	S-43725					
L19	Discriminator (Pri.)	S-24788					
L20	Discriminator (Sec.)	S-24789					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	117V @ .3A	220V @ .040A DC Tap @ 35V @ .002A DC	5V @ 2A	95-1697						
	SEC. 3		SEC. 5							
		Tap @ 6.3V @ 2A								

RECTIFIERS

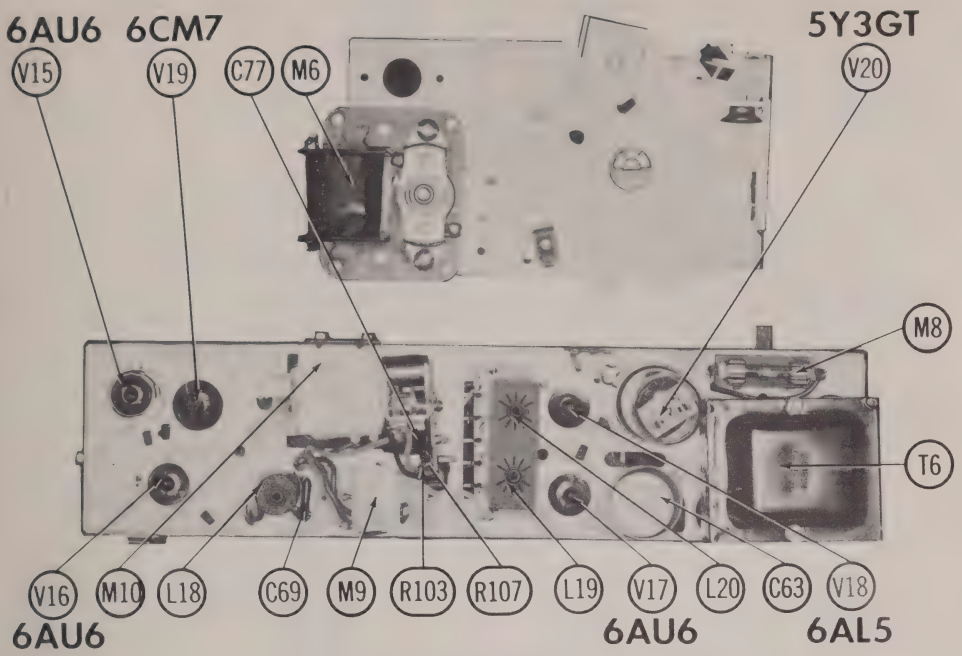
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M7	.002A	212-21 *			10 *		* Selenium Type

FUSES

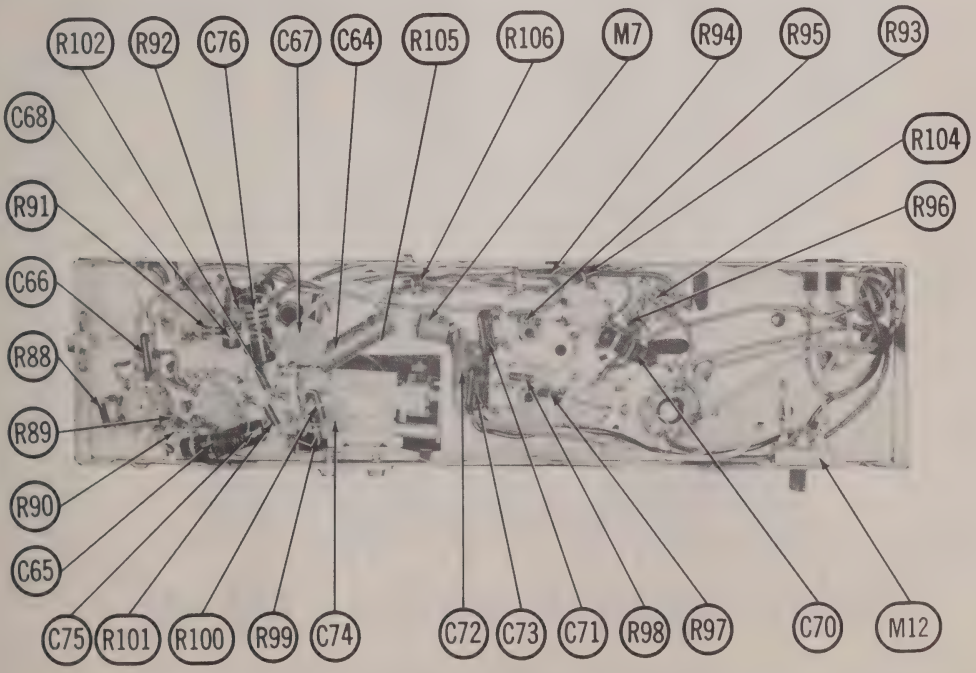
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M8	3AG	3/4A 125V S/B	136-41		313.750 (3AG 3/4A 125V S/B)	357001	MDL 3/4	4405

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M9	Relay	195-5	Motor, C. W.
M10	Relay	S-4866	Step (Includes Step Switch Pt. #S-43848)
M11	Switch	S-44018	Channel Selector
M12	Switch	85-580	Auto-Manual (DPDT Slide Type)
M13	Microphone	S-47486	



REMOTE CONTROL RECEIVER S-48583 - TOP VIEW



REMOTE CONTROL RECEIVER S-48583 - BOTTOM VIEW

TUNER PARTS LIST AND DESCRIPTIONS

175—152

TUBES

• GENERAL ELECTRIC •		• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6BK7B	V202	Mixer - Osc.	6EA8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	12 NPO 2.5%	#22-2679		TCZ-12				
C202	18 1000V 5%				C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C203	18 1000V 5%				C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C204	12 NPO 2.5%	#22-2679		TCZ-12				
C205	8.2 NPO .25mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C206	1000		EF-001	MFT-1000		CCF-102	CT280A	
C207	1.8 10%		NPO-SI 2.0		C10V2C			10TCC-V18
C208	1000		EF-001	MFT-1000		CCF-102	CT280A	
C209	25 N750 10%		N750-DI 25	DTN-25	C10Q25U	CCTN-270	CN7-427	10TCU-Q25
C210	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	5 N330 5%	#22-2716				*		
C213	5 N330 5%	#22-2716				*		
C214	1 N1500 ±.1mmf	#22-2714						
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	800		BPD-0008	DD-801	L10T8	CCD-801	B-382	10TS-T80

Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	22K	
R202	220K	
R203	220K	
R204	33K	

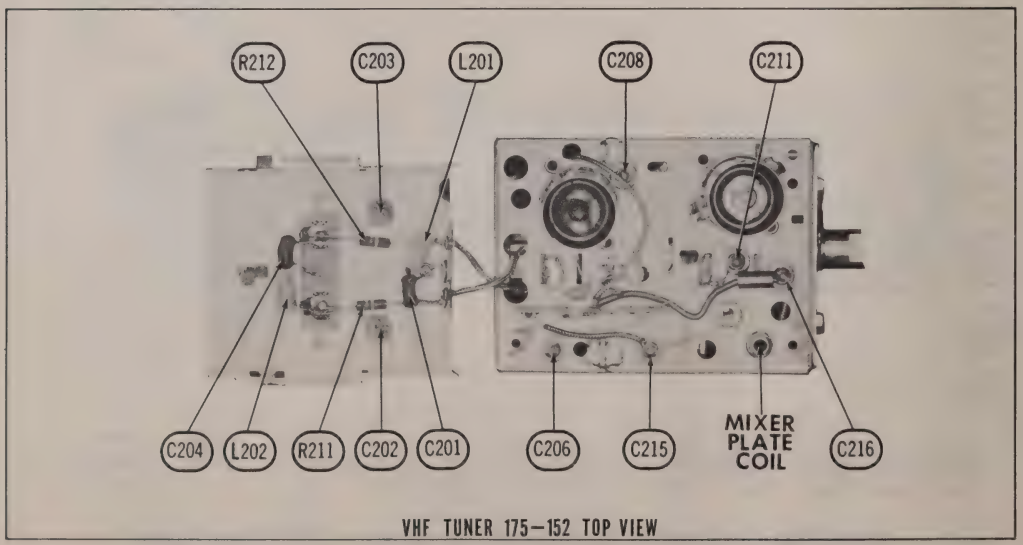
ITEM No.	RATING	REMARKS
R205	1200Ω 1W	
R206	100K	
R207	68K	
R208	10K	

ITEM No.	RATING	REMARKS
R209	4700Ω	
R210	10K 2W	
R211	230K	
R212	230K	

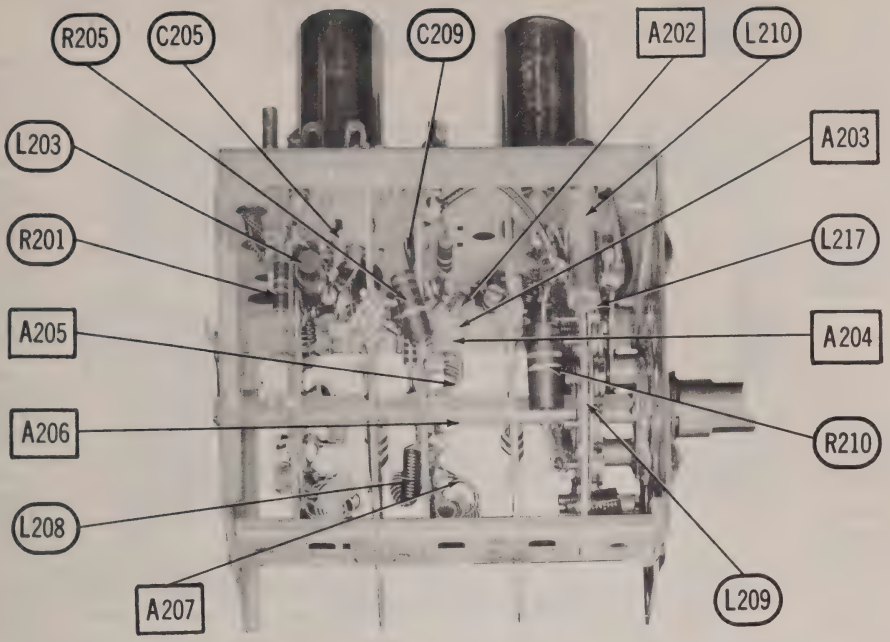
COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	RF Choke	20-567	
L202	RF Choke	20-567	
L203	Ant. Trans.	S-24645	
L204	Ant. Coils	S-43341	Channel 2 thru 12, Includes Wafer Assembly
L205	Ant. Coil	20-600	Channel 13
L206	RF Choke	20-633	
L207	RF Coils	S-23640	Channel 2 thru 12, Includes Wafer Assembly
L208	RF Choke	20-579	

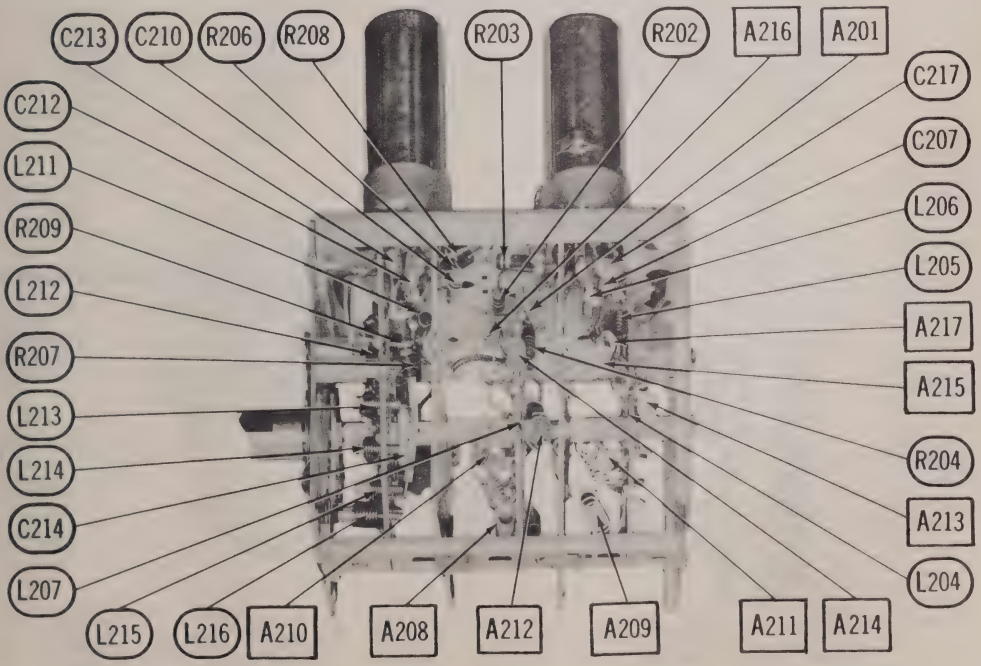
ITEM No.	USE	ZENITH PART No.	NOTES
L209	Osc. Coils	S-41807	Channel 2 thru 13, Includes Wafer Assembly
L210	Mixer Plate Coil	S-43490	
L211	RF Choke	20-632	
L212	Osc. Coil	20-662	Channel 2
L213	Osc. Coil	20-663	Channel 3
L214	Osc. Coil	20-664	Channel 4
L215	Osc. Coil	20-665	Channel 5
L216	Osc. Coil	20-666	Channel 6
L217	Osc. Coil	20-667	Channel 13



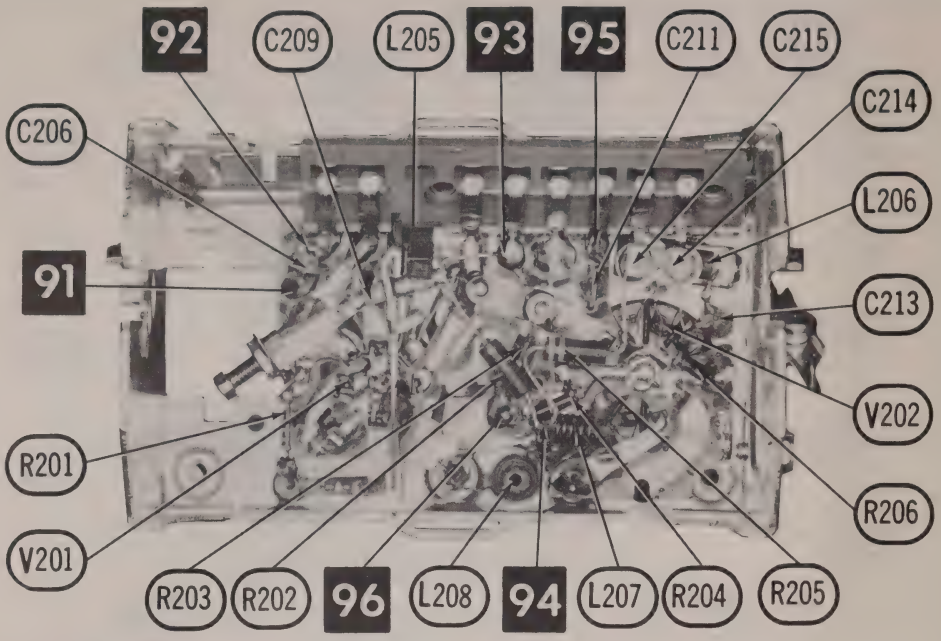
VHF TUNER 175—152 TOP VIEW



VHF TUNER 175-152-LEFT SIDE



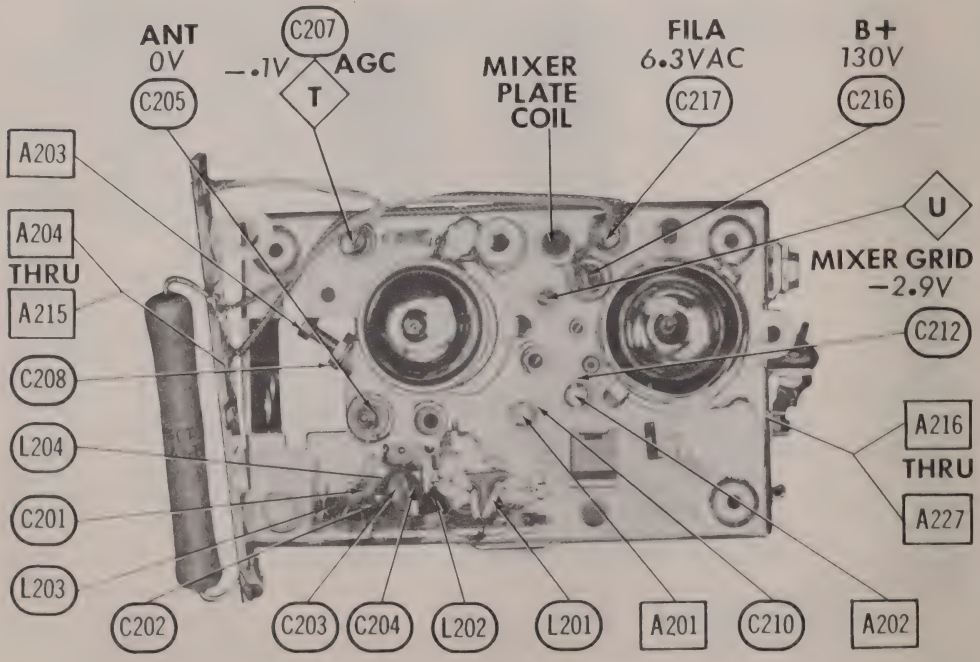
VHF TUNER 175-152-RIGHT SIDE



A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 175-148 - BOTTOM VIEW



VHF TUNER 175-148 - TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

175-146 ,-148

TUBES

• GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6FH5	V202	Mixer - Osc.	6CG8A (6CG8) *

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30 +7 -3.5%	Pt. #22-3111						
C206	28 10%		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7	Pt. #22-3191		829-7				
C209	100 5%	Pt. #22-3192						
C210	.5-3.5	Pt. #22-3190						
C211	33 10%		DI-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C212	.5-3.5	Pt. #22-3190						
C213	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	6.8 ±.25mmf		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C215	18 N220 10%	Pt. #22-3025				*		10TCR-Q18
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	* REMARKS
R201	47K	
R202	1000Ω	

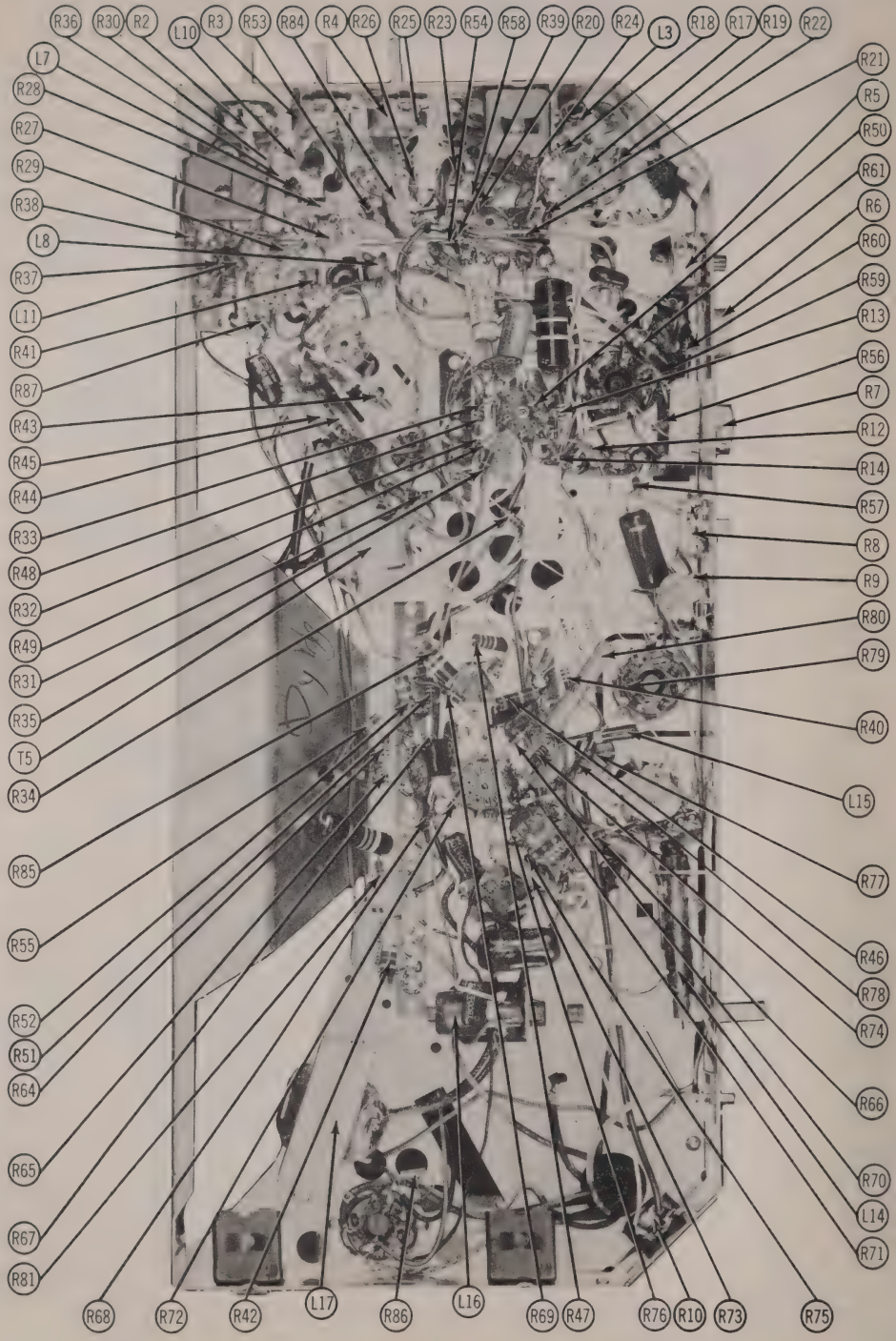
ITEM No.	RATING	REMARKS
R203	2700Ω	
R204	220K	

ITEM No.	RATING	REMARKS
R205	4700Ω	
R206	4700Ω	

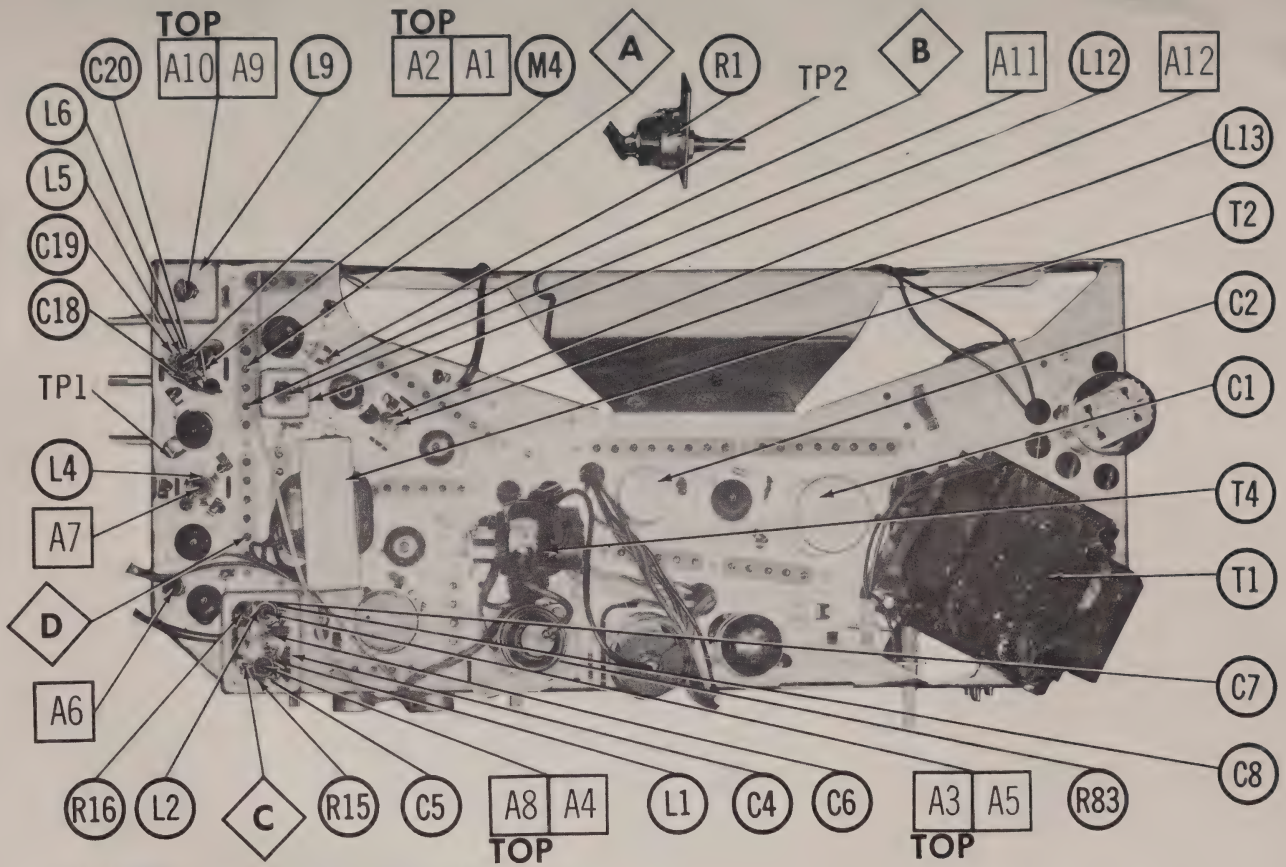
COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Trans.	S-47681	
L202	Trap Coil	20-762	
L203	Trap Coil	20-763	
L204	Trap Coil	20-762	
L205A	Ant., RF, Mixer, & Osc. Coils	174-22	Channel 2
B	"	174-23	Channel 3
C	"	174-24	Channel 4
D	"	174-25	Channel 5
E	"	174-26	Channel 6
F	"	174-27	Channel 7

ITEM No.	USE	ZENITH PART No.	NOTES
L205G	Ant., RF, Mixer, & Osc. Coils	174-28	Channel 8
H	"	174-29	Channel 9
I	"	174-30	Channel 10
J	"	174-31	Channel 11
K	"	174-32	Channel 12
L	"	174-33	Channel 13
L206	Fine Tuning Coil	S-47481	
L207	RF Choke	20-758	
L208	Mixer Plate Coil	S-47370	



TV CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

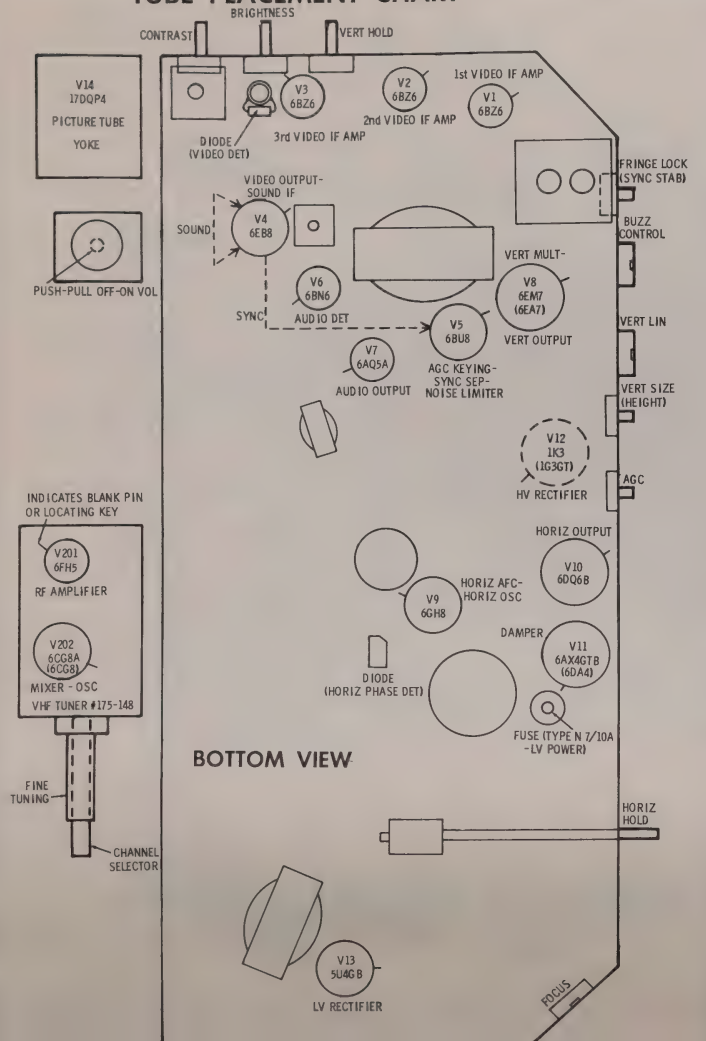


TV CHASSIS - TOP VIEW

ZENITH CHASSIS 16E25,
16E25U, 16E25G, S-48583

FOLDER 2

TUBE PLACEMENT CHART

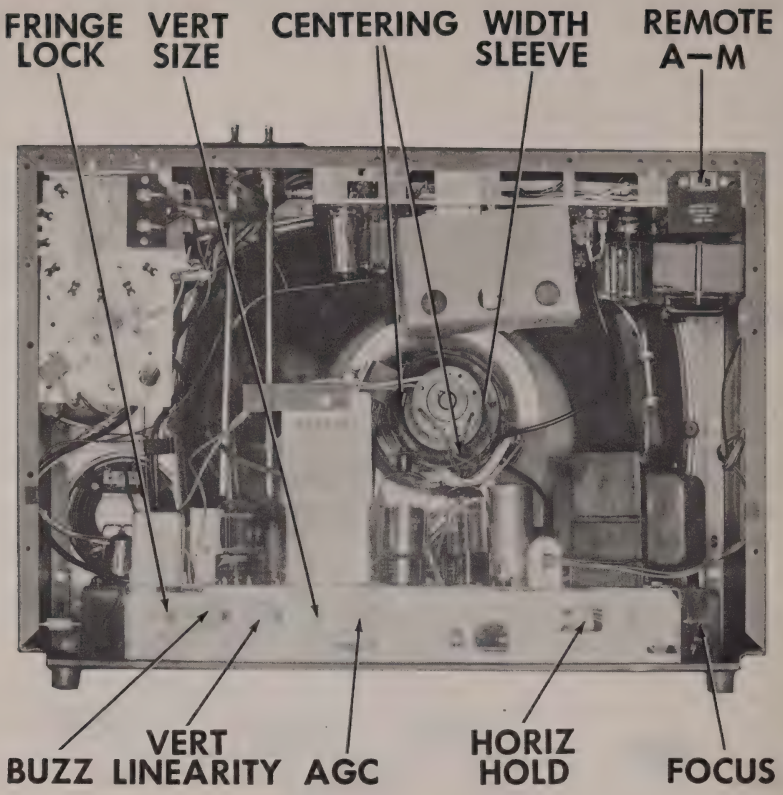


RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.4meg	1550Ω	.1Ω	0Ω	▪500Ω	▪500Ω	1500Ω		
V2	6BZ6	32K	INF	.1Ω	0Ω	†550Ω	†550Ω	▪27Ω		
V3	6BZ6	0Ω	120Ω	0Ω	.1Ω	†5600Ω	†5600Ω	0Ω		
V4	6EB8	0Ω	100K	†470K	.1Ω	0Ω	15Ω	3000Ω	†22K	†7500Ω
V5	6BU8	•7000Ω	†10K	•690K	.1Ω	0Ω	115K	◆1.8meg	†85K	†8.2meg
V6	6BN8	•280Ω	.5Ω	0Ω	.1Ω	†27K	3.7Ω	†390K		
V7	6AQ5A	NC	680Ω	0Ω	.1Ω	†1700Ω	†1000Ω	•0Ω		
V8	6EM7	1.3meg	†410Ω	•550Ω	•700K	†•6meg	0Ω	0Ω	.1Ω	
V9	6GH8	†100K	100K	†47K	.1Ω	0Ω	†82K	100Ω	0Ω	1.7meg
V10	6DQ6B	NC	.1Ω	NC	†7600Ω	1meg	TP	0Ω	15Ω	TOP CAP †15Ω
V11	6AX4GTB	TP	TP	¶	NC	†50Ω	TP	.1Ω	0Ω	
V12	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †205Ω
V13	5U4GB	NC	¶	TP	27Ω	NC	30Ω	TP	¶	
V14	17DQP4	NC	•180K	.1Ω	0Ω	0Ω	†•2meg	27K		
V201	6FH5	0Ω	3meg	0Ω	.1Ω	†5700Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†9500Ω	0Ω	0Ω	.1Ω	†4700Ω	†4700Ω	0Ω	223K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 3 OF V11.
† MEASURED FROM PIN 2 OF V13.
▪ MEASURED FROM PIN 2 OF V2.

NC NO CONNECTION
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270° with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL E2010C

1. Remove 6 metal screws holding rear cover. Remove rear cover.
2. Remove 3 push-on type knobs in front and 3 push-on type knobs at side of cabinet.
3. Remove mike lead, remote control leads (and 2 plugs), pilot lamp lead, and VHF Tuner leads.
4. Remove 2 screws holding remote control receiver chassis to cabinet. Remove chassis.
5. Disconnect antenna leads. Remove 2 screws holding VHF Tuner mounting bracket to cabinet. Remove VHF Tuner with mounting bracket.
6. Remove 2 screws holding on-off switch.
7. Remove 4 chassis bolts at bottom and 2 screws at top holding picture tube mounting bracket to cabinet (inside).
8. Remove chassis (with picture tube).

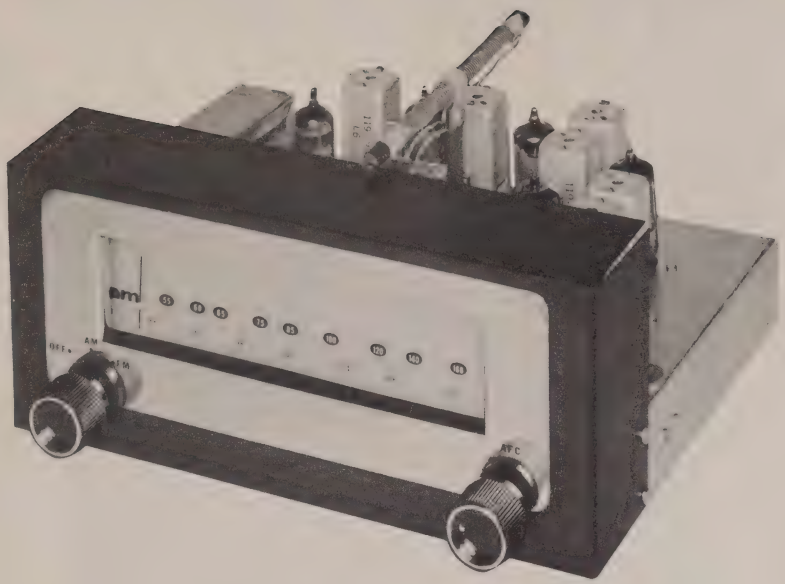
PICTURE TUBE REMOVAL

It is necessary to remove remote control receiver chassis and TV chassis for picture tube removal. See "Chassis Removal".

PHOTOFACT® Folder

**ARKAY
MODEL HFT-7**

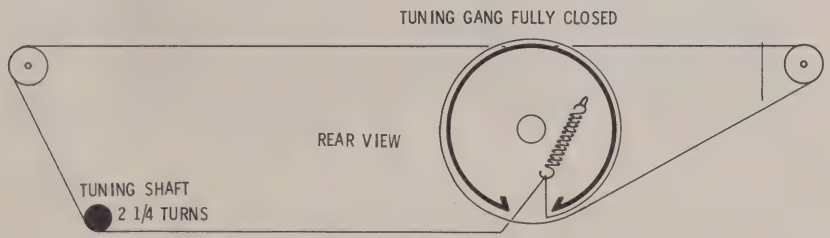
ARKAY
MODEL HFT-7



ARKAY
MODEL HFT-7

TRADE NAME	Arkay Model HFT-7		
MANUFACTURER	Arkay International, Inc., 88-06 Van Wyck Expressway, Jamaica 18, N. Y.		
TYPE SET	AC Operated 7 Tube FM-AM Tuner		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	27 Watts, .26 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 — 1650KC	FREQ. MOD.	88 — 108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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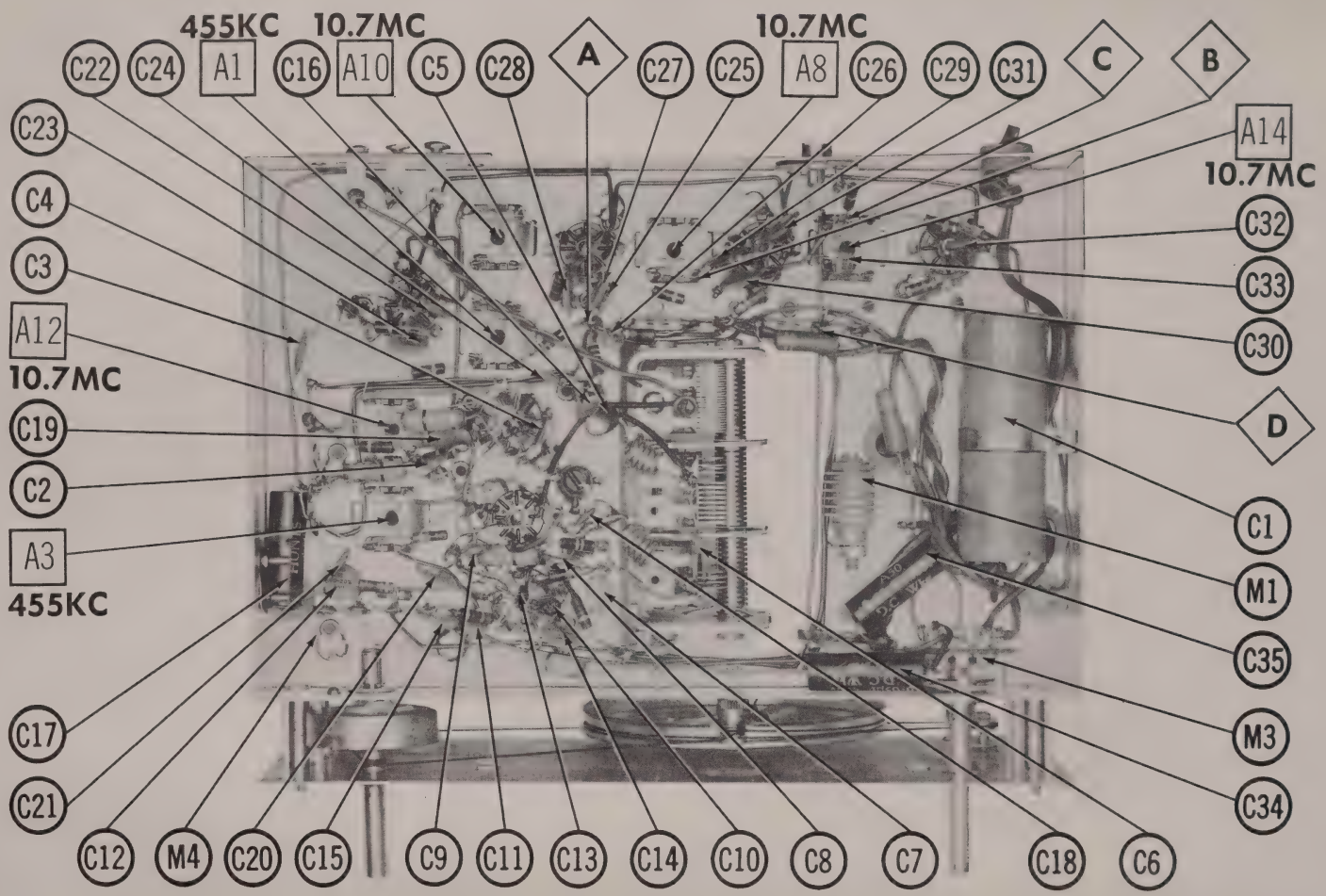
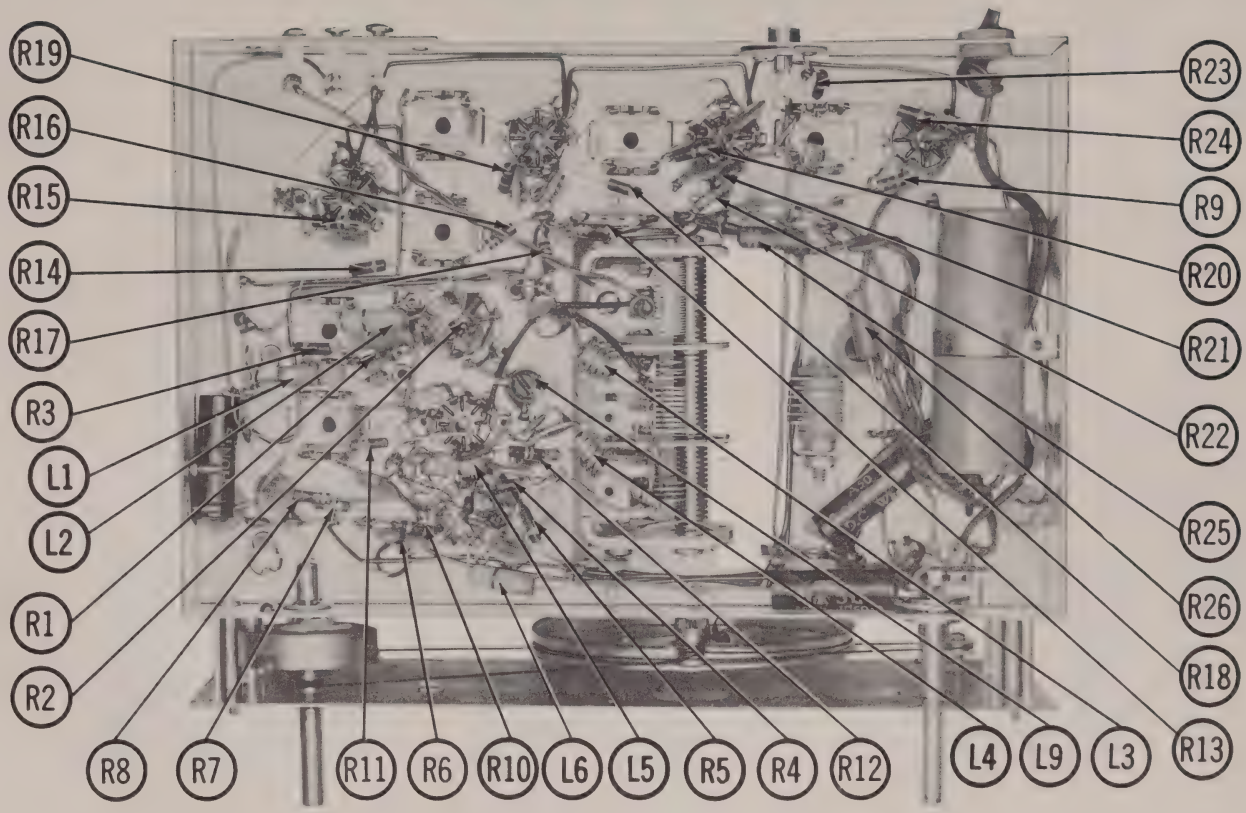
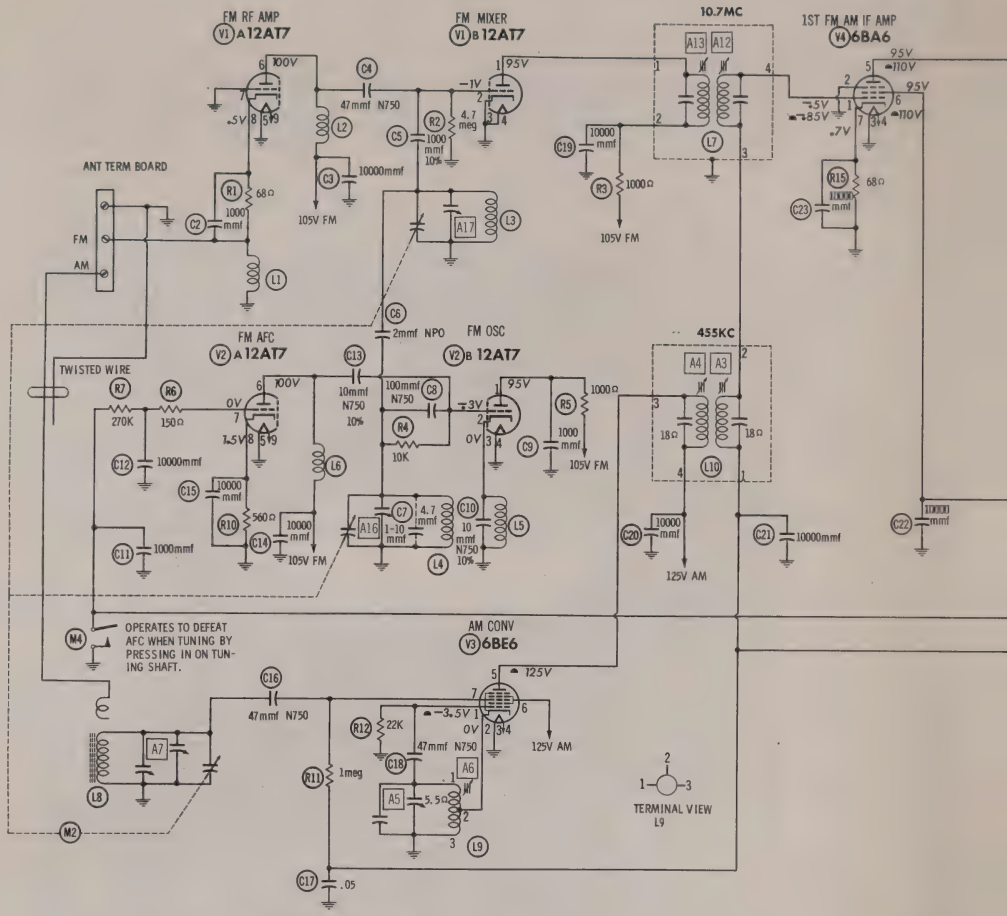


CHASSIS BOTTOM VIEW — ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW – RESISTOR & INDUCTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7 ECC81	†1600Ω	4.7meg	0Ω	0Ω	0Ω	†660Ω	0Ω	68Ω	.1Ω
V2	12AT7 ECC81	†1600Ω	10K	0Ω	0Ω	0Ω	†660Ω	1.5meg ■270K	560Ω	.1Ω
V3	6BE6 EK90	22K	.1Ω	0Ω	.1Ω	●†680Ω	●†660Ω	2.5meg		
V4	6BA6 EF93	1.5meg	0Ω	0Ω	.1Ω	†1600Ω	†1600Ω	68Ω		
V5	6AU6 EF94	520K	0Ω	0Ω	.1Ω	†INF ●†1600Ω	†INF ●†1600Ω	68Ω		
V6	6AU6 EF94	100K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V7	6AL5	0Ω	100K	0Ω	.1Ω	200K	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
● MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
■ MEASURED IN "AFC DEFEAT" POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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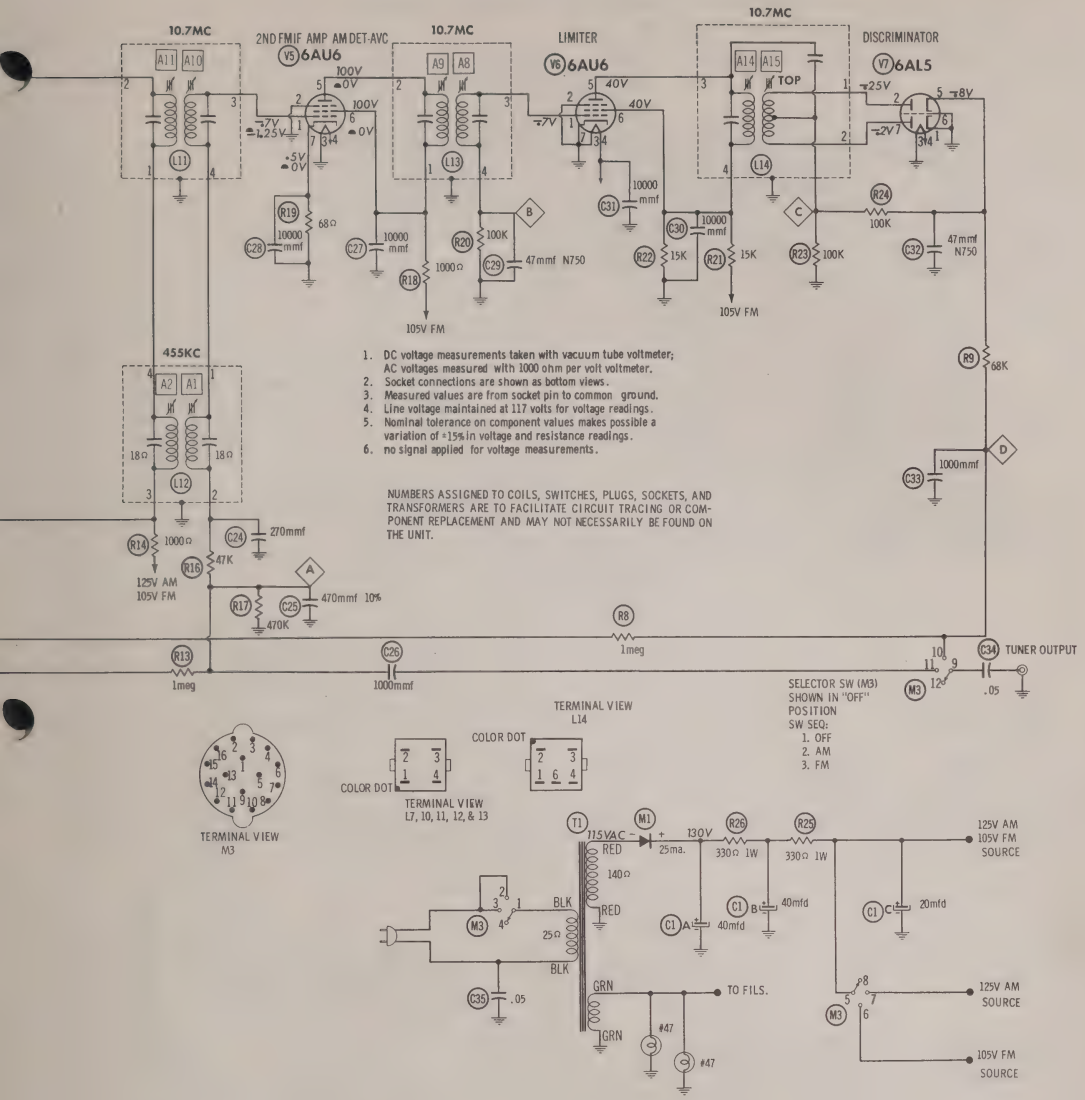


ARKAY
MODEL HFT-7

FOLDER 3

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 thru A4 and A8 thru A15.... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A7, A17..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6, A16..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (Unmod.)	(AM) Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	High side to AM antenna terminal. Low side to chassis.	1650KC	"	"	A5	"
3.	"	600KC	600KC Signal.	"	A6	Adjust for maximum deflection. Repeat Steps 2 and 3.
4.	"	1400KC	1400KC Signal.	"	A7	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (B). Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	DC probe thru 1meg to point (C). Common to chassis.	A14	"
7.	"	"	"	DC probe to point (D). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. thru 47K to point (C). Low side to chassis.	A14	"
7.	"	"	"	Vert. amp. to point (D). Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals.	108MC (Unmod.)	(FM) 108MC	DC probe to point (B). Common to chassis.	A16	Adjust for maximum deflection.
9.	"	88MC	88MC	"	L4	Adjust for maximum deflection by expanding or compressing coil turns. Repeat Steps 8 and 9.
10.	"	106MC	106MC	"	A17	Adjust for maximum deflection.

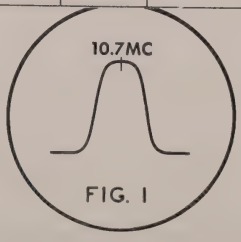


FIG. 1

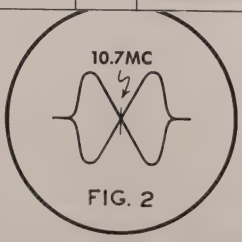


FIG. 2

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	12AT7/ECC81	V5	2nd FM IF Amplifier-AM Det. -AVC	6AU6/EF94
V2	FM Osc. -FM AFC	12AT7/ECC81	V6	FM Limiter	6AU6/EF94
V3	AM Converter	6BE6/EK90	V7	Discriminator	6AL5
V4	1st FM-AM IF Amplifier	6BA6/EF93			

ELECTROLYTIC CAPACITORS

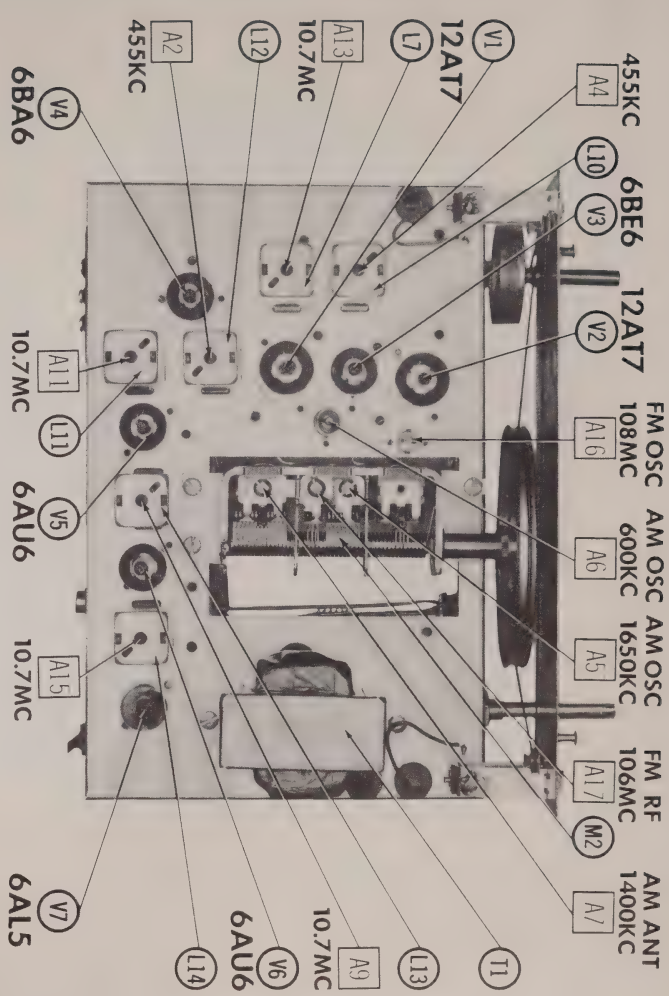
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ARKAY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS3650	BBRT44215	WT217	TDLT-4	TVA-3451	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C6	2 NPO		NPO-DI 2.2	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C7	1-10			829-10				
C8	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-310	10TCU-T10
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C17	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C18	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C25	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C33	1000		BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C34	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C35	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	68Ω	
R2	4.7meg	
R3	1000Ω	
R4	10K	
R5	1000Ω	
R6	150Ω	
R7	270K	
R8	1meg	
R9	68K	

ITEM No.	RATING	REMARKS
R10	560Ω	
R11	1meg	
R12	22K	
R13	1meg	
R14	1000Ω	
R15	68Ω	
R16	47K	
R17	470K	
R18	1000Ω	

ITEM No.	RATING	REMARKS
R19	68Ω	
R20	100K	
R21	15K	
R22	15K	
R23	100K	
R24	100K	
R25	330Ω 1W	
R26	330Ω 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARKAY PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	FM Ant. Coil		BC-561	4594		RTC-8515	.82uh ①
L2	RF Choke		BC-561	4594		RTC-8515	.82uh ①
L3	FM RF Coil						
L4	FM Osc. Coil						
L5	Cathode Choke		BC-561	4594		RTC-8515	.82uh ①
L6	RF Choke		BC-561	4594		RTC-8515	.82uh ①
L7	1st FM IF Trans.	1607-1	FM-254	1463		RTC-8599	
L8	Loopstick		BC-419	705-A			
L9	AM Osc. Coil		BC-393	70-OSC		RTC-8647	
L10	1st AM IF Trans.	L-100	BC-352	12-C1	RF-1	RTC-8632	
L11	2nd FM IF Trans.	1607-1	FM-254	1463		RTC-8599	
L12	2nd AM IF Trans.	L-100	BC-353	12-C2	RF-2	RTC-8633	
L13	3rd FM IF Trans.	1607-1	FM-254	1463		RTC-8599	
L14	Discriminator	2607-1	FM-253	1464		RTC-8665	

① IRC Part #CLA.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	ARKAY PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .26A	115V@ .035A	6.3V@ 2.4A	HFT-7			PA-8421①			

① Drill New Mounting Holes.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ARKAY PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.025A			1N1763 ♦	65A *	SR200 ♦	* Selenium Type ♦ Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	ARKAY PART No.	NOTES
M2	Tuning Cap.		FM-AM, 4 Gang (AM Sections: Ant. 27-478mmf, Osc. 22-166mmf)
M3	Switch		Selector (Rotary Wafer Type)
M4	Switch		AFC (Actuated by push-on tuning control)

PHOTOFACT® Folder with CIRCUITRACE*

ARVIN MODELS 60R33, 60R35, 60R38, 60R58 (Ch. 1.47601, 1.50300)

ARVIN MODELS 60R33, 60R35, 60R38, 60R58 (Ch. 1.47601, 1.50300)

TRADE NAME	Arvin Models 60R33, 60R35, 60R38 (Ch. 1.47601); 60R58 (Ch. 1.50300)		
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	8MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE	BROADCAST 540 - 1670KC		20MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3 .. GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A5 ..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A6 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to antenna stator of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.	Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC Signal	"	A5	"
4.	"	600KC	600KC Signal	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KF168

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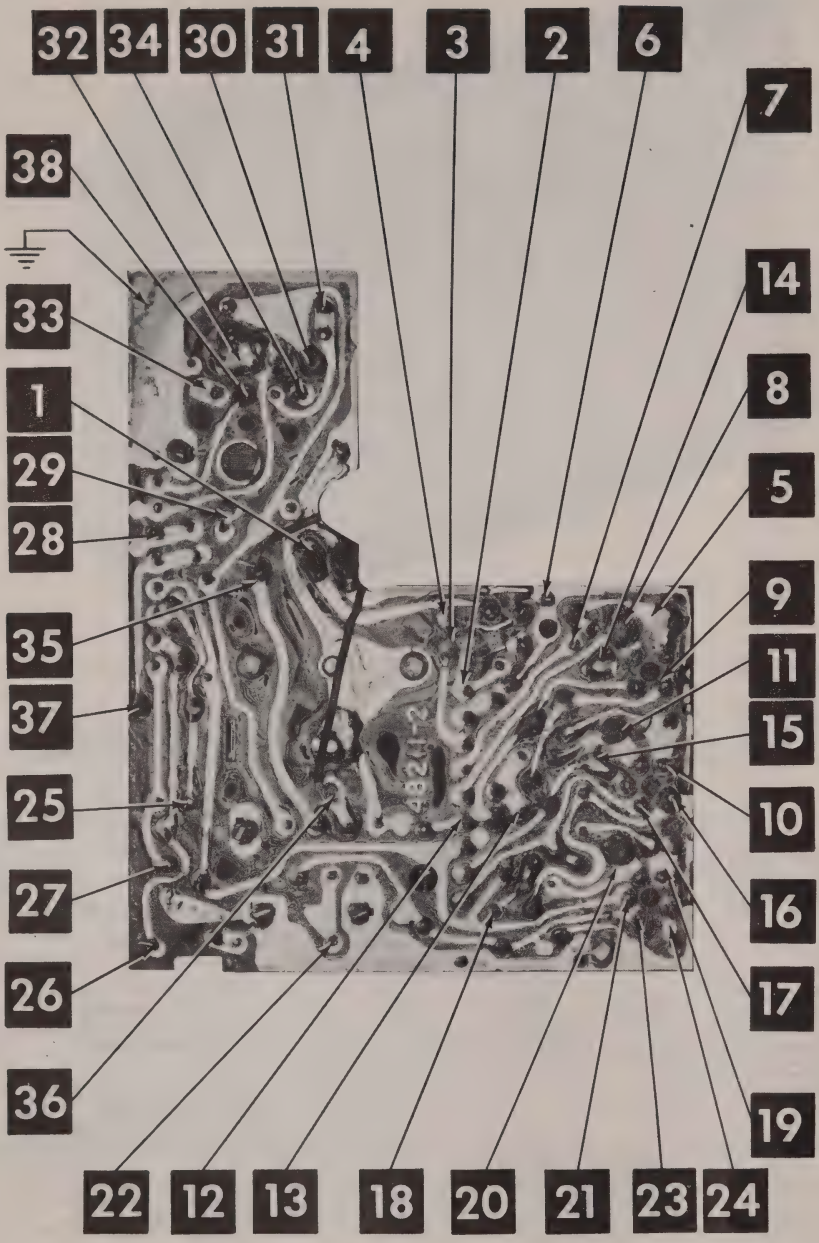
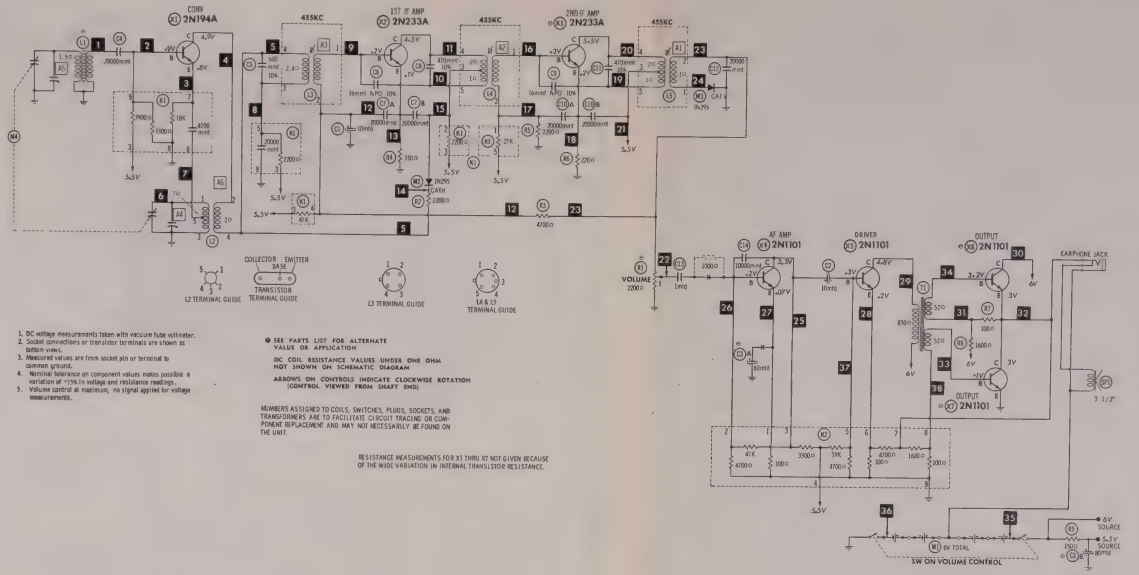
SET 507 FOLDER 4



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS FOR X1 THRU X7 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1960

ARVIN MODELS 60R33, 60R35, 60R38, 60R58 (Ch. 1.47601, 1.50300)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter		2N1366	2N194	NPN
X2	2N233A	1st IF Amplifier		2N1367	2N233A	NPN
X3	2N233A †	2nd IF Amplifier		2N1367	2N233A	NPN
X4	2N1101	AF Amplifier	2N649		2N1101	NPN
X5	2N1101	Driver	2N649		2N1101	NPN
X6	2N1101 *	Output	2N649		2N1101	NPN
X7	2N1101 *	Output	2N649		2N1101	NPN

† Type 2N94 used in Chassis 1. 50300

* Type 2N1059 used in Chassis 1. 50300

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10	44396-4	PTT10010	NLW10-15	TT12X10	ML10-15	TE-1114	
C2	10	10	44396-4	PTT10010	NLW10-15	TT12X10	ML10-15	TE-1114	
C3A	80	12	44397-3	BCD10X8080	ECPAN14			VL-2350	Note 1
B	80	12							Note 1

Note 1. C3A is not used in Chassis 1. 50300 (C3 Part #44279-8).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C6	16 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C7A	20000		BPD-2X02	DD3-203	BYB6S2	CCD-203	B-120	
B	20000				BYB6S2	CCD-203	B-120	
C8	470 10%		1469-00047	DD-471	5R5T47	CM-19B-471K	MCJ244	MS-347
C9	16 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C10A	20000		BPD-2X02	DD3-103	BYB6S2	CCD-203	B-120	
B	20000				BYB6S2	CCD-203	B-120	
C11	470 10%		1469-00047	DD-471	5R5T47	CM-19B-471K	MCJ244	MX-347
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	1mfd 3V			UK-105				HY-135
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2200Ω	1/4	46800-1 ①					Volume
B	Switch							Power Off-On

① Part #47500-9 used in Chassis 1. 50300.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	2200Ω	
R3	4700Ω	
R4	330Ω	

ITEM No.	RATING	REMARKS
R5	2200Ω	
R6	220Ω	
R7	100Ω	

ITEM No.	RATING	REMARKS
R8	1600Ω	
R9	150Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA
K1	RF-IF Circuit	4700mmf, 20000mmf, 2200Ω, 2200Ω, 3300Ω, 3900Ω, 18K, 27K, 47K	46000-8	
K2	Bias & Dec. Circuits	(3) 100Ω, 1600Ω, 3300Ω, (3) 4700Ω, 47K, 39K	46000-7	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARVIN PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	45534-13 ①					
L2	Osc. Coil	45783-9					
L3	1st IF Trans.	44855-12					
L4	2nd IF Trans.	44855-13					
L5	3rd IF Trans.	44855-14					

① Part #46861-4 used in Chassis 1. 50300.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA ARVIN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4	1 SEC. 2 1	45604-7					

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ARVIN PART No.	QUAM PART No.	NOTES
SP1	3½" 5"	PM	29. 2Ω	46523-4 45599-9 *	3A05Z30	* Used in Chassis 1. 50300

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1. 5V			130 *		635 *		M-14R *	* Four required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ARVIN PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295	43959	1N295	1N295	Overload & AVC (Pigtail)
M3	1N295	43959	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M4	Tuning Cap.	48346	2 Gang, Chassis 1. 47601
	Tuning Cap.	48384	2 Gang, Chassis 1. 50300
	Printed Board	48211-2	

CABINETS & CABINET PARTS

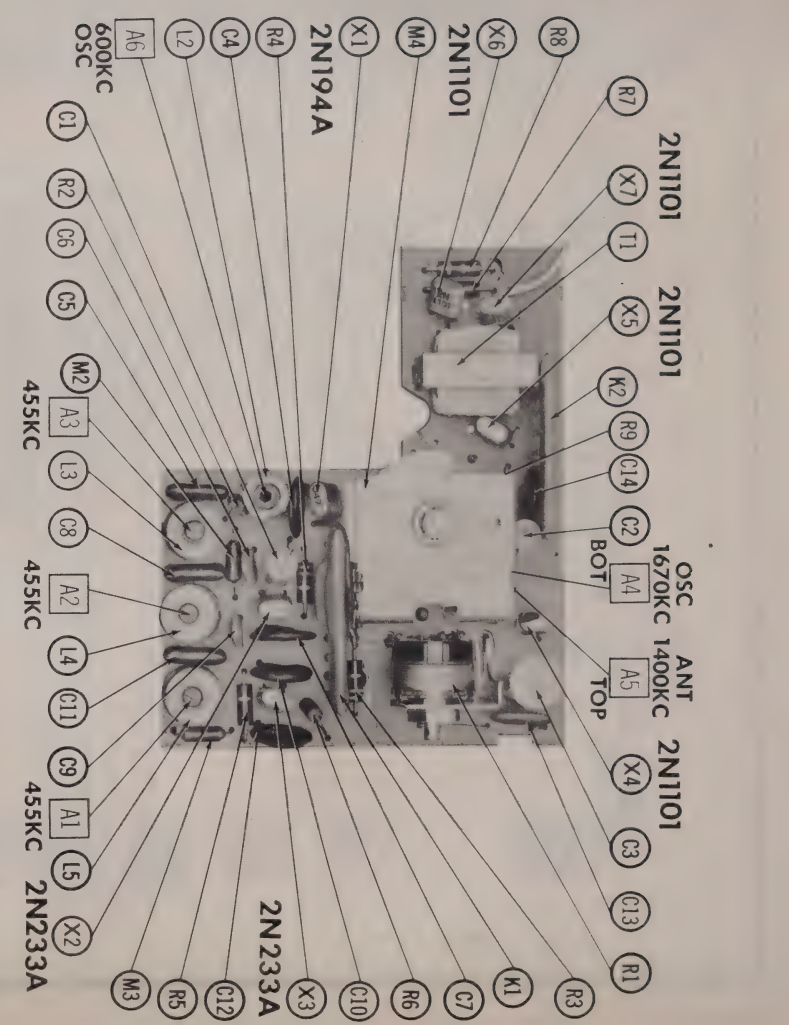
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	46807-29	Station Indicator, Black, Models 60R33, 60R35, 60R38
Knob	46659	Tuning, Models 60R33, 60R35, 60R38
Knob	47896-188	Volume, Models 60R33, 60R35, 60R38
Knob	47896-115	Volume, Slate Blue, Models 60R33, 60R35, 60R38
Knob	47896-33	Volume, Flame, Models 60R33, 60R35, 60R38
Cabinet	47900-33	Front Assembly, Flame, Models 60R33, 60R35, 60R38
Cabinet	47900-115	Front Assembly, Slate Blue, Models 60R33, 60R35, 60R38
Cabinet	47900-188	Front Assembly, Taupe, Models 60R33, 60R35, 60R38
Cabinet	46611-135	Back, Moonstone, Models 60R33, 60R35, 60R38
Cabinet	46611-208	Back, Sandstone, Models 60R33, 60R35, 60R38
Handle	47891-1	Chrome, Models 60R33, 60R35, 60R38
Handle	47891-2	Brass, Models 60R33, 60R35, 60R38
Knob	48216	Station Indicator, Model 60R58
Knob	47731	Volume, Model 60R58
Knob	48215	Tuning, Model 60R58
Cabinet	49054-198	Model 60R58

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

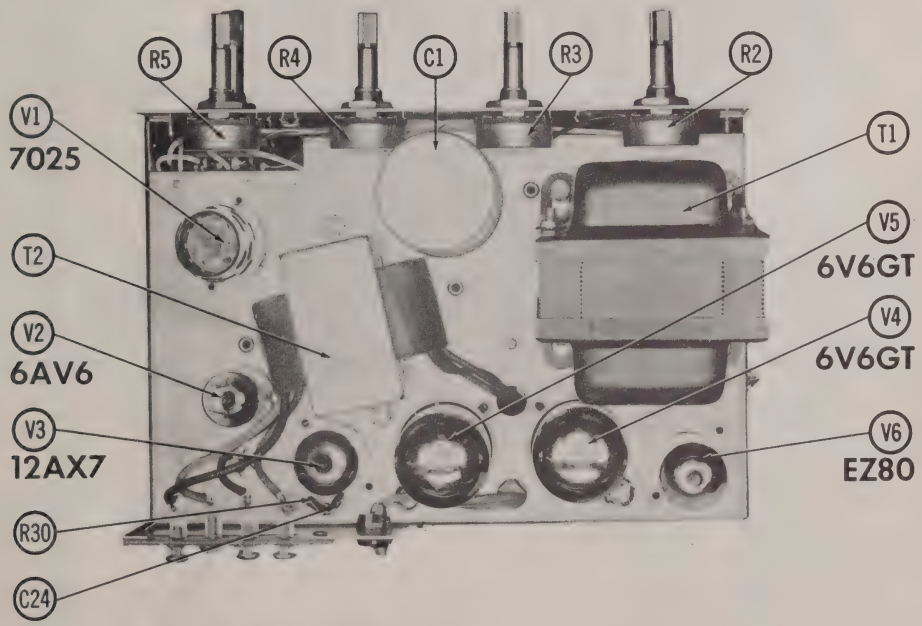
CHASSIS—TOP VIEW



PHOTOFACT® Folder

**BLONDER-TONGUE
MODEL A-1B**

TRADE NAME	Blonder-Tongue Model A-1B
MANUFACTURER	Blonder-Tongue Laboratories, Inc., 9 Alling Street, Newark 2, N. J.
TYPE SET	AC Operated 6 Tube Audio Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 38 Watts, .39 Amp. @117 Volts AC



BLONDER-TONGUE
MODEL A-1B

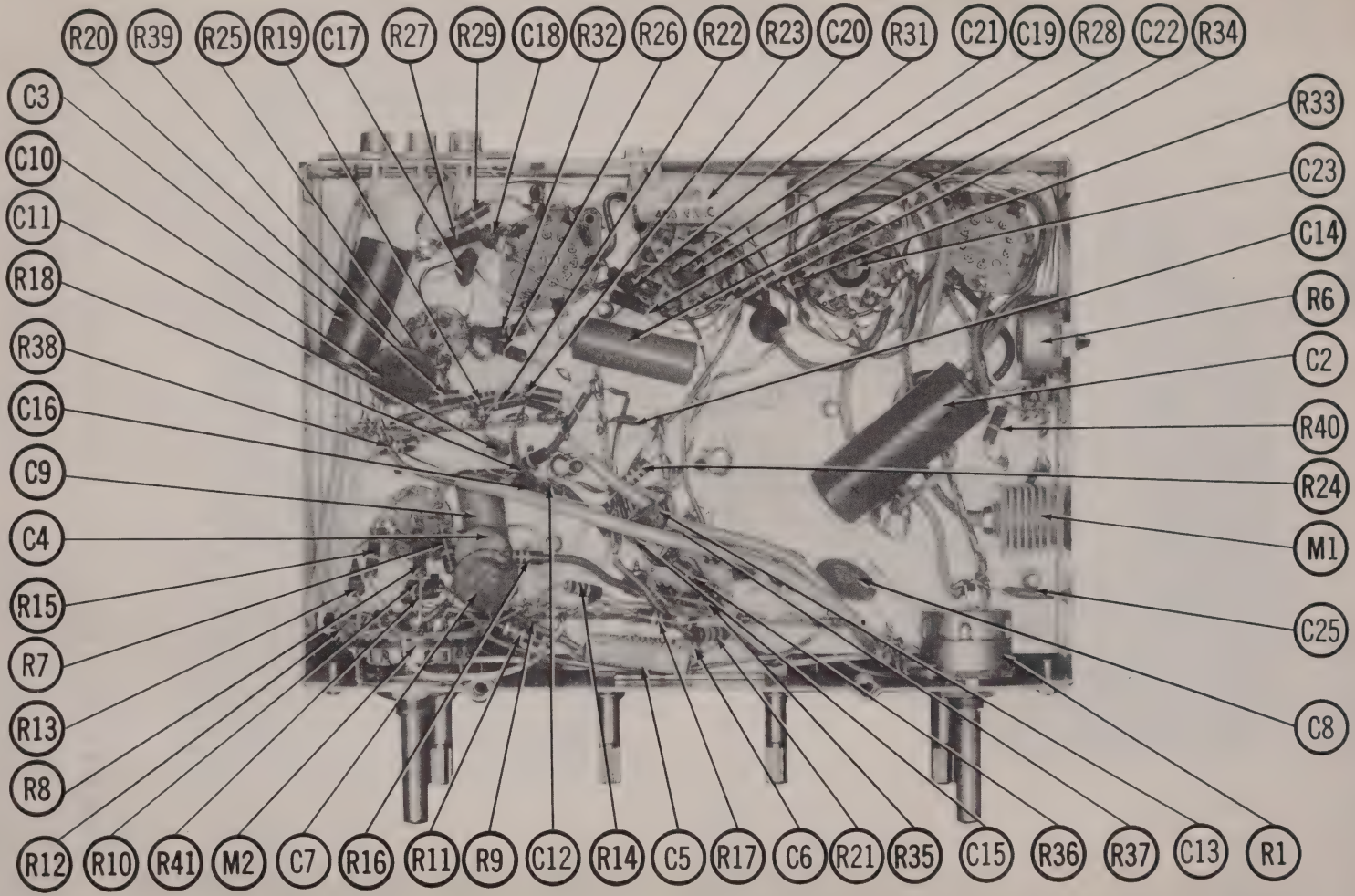
BLONDER-TONGUE
MODEL A-1B

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KX173

SET 507 FOLDER 5



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆	RAYTHEON ◆		SYLVANIA ◆	
V1	Preamplifier	7025/12AX7A	V4	Output	6V6GT
V2	AF Amplifier	6AV6	V5	Output	6V6GT
V3	AF Amp. -Phase Inv.	12AX7	V6	Rectifier	EZ80/6V4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Blonder-Tongue PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	2300031	AFH4-17	D0160	FP475.5	TMQ-4634	TVL-4771.3	
B	10	450							
C	■10	450							
D	▲10	450							
C2	50	50	2350601	PRS1350	BR505	TC39	TD-50-50	TVA-1308	
C3	100	3	2310702	PRS1100	BBR100-6	TT6X100	TD-100-6	TVA-1101	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C5	.015 400V		P488N-015	DD-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C6	.0068 200V		P288N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C10	4700 10%		DI-4700		PM6D47	CCD-472	JL247	10TS-D47
C11	47 N750		N750-DI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C12	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C13	560		DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C14	82 N1500					*		
C15	68 NPO 5%			DTZ-68	C10Q68C		CNO-468	10TCC-Q68
C16	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C17	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C18	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C19	6.8 N330 2000V							
C20	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C21	22 N750 10%		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C22	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C23	22 N750 10%		N750-DI 22	DTN-22	C10Q22U	CCTN-22	CN7-422	10TCU-Q22
C24	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Blonder-Tongue PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	1450411	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	500K	½	1450410	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	1450410	B-60	A47-500K-Z	Q13-133	U48	Low Middle
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500K	½	1450410	B-60	A47-500K-Z	Q13-133	U48	High Middle
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	500K	½	1450410	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R6A	250Ω	½	1421506	TT-2		Bil-201		Hum Balance
B	Shaft			Not Req.		TM4		

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R7	10meg	
R8	2.2meg	
R9	470K	
R10	220K	
R11	470K	
R12	47K	
R13	100Ω	
R14	680Ω	
R15	1000Ω	
R16	470K	
R17	10K	
R18	100K	

ITEM No.	RATING	REMARKS
R19	680K	
R20	1.5meg	
R21	680K	
R22	1.5meg	
R23	1meg	
R24	270K	
R25	470K	
R26	220K	
R27	1.5meg	
R28	1.5meg	
R29	680Ω	
R30	1500Ω	

ITEM No.	RATING	REMARKS
R31	220K	
R32	220K	
R33	220K	
R34	220K	
R35	22K	
R36	22K	
R37	4700Ω	
R38	10K	
R39	220K	
R40	2200Ω	
R41	220K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Blonder-Tongue PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ .39A	560 VCT @ .035A (.100A Max. Sig.) Tap@ 27V@ .002A	6.3V@ 2.4A	3110035						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Blonder-Tongue PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7300Ω CT	16Ω Tap@ 8Ω, 4Ω	3210010						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Blonder-Tongue PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.002A	*			10 *		* Selenium Type

MISCELLANEOUS

ITEM No.	PART NAME	Blonder-Tongue PART No.	NOTES
M2	Switch		Function Selector (Rotary Wafer)

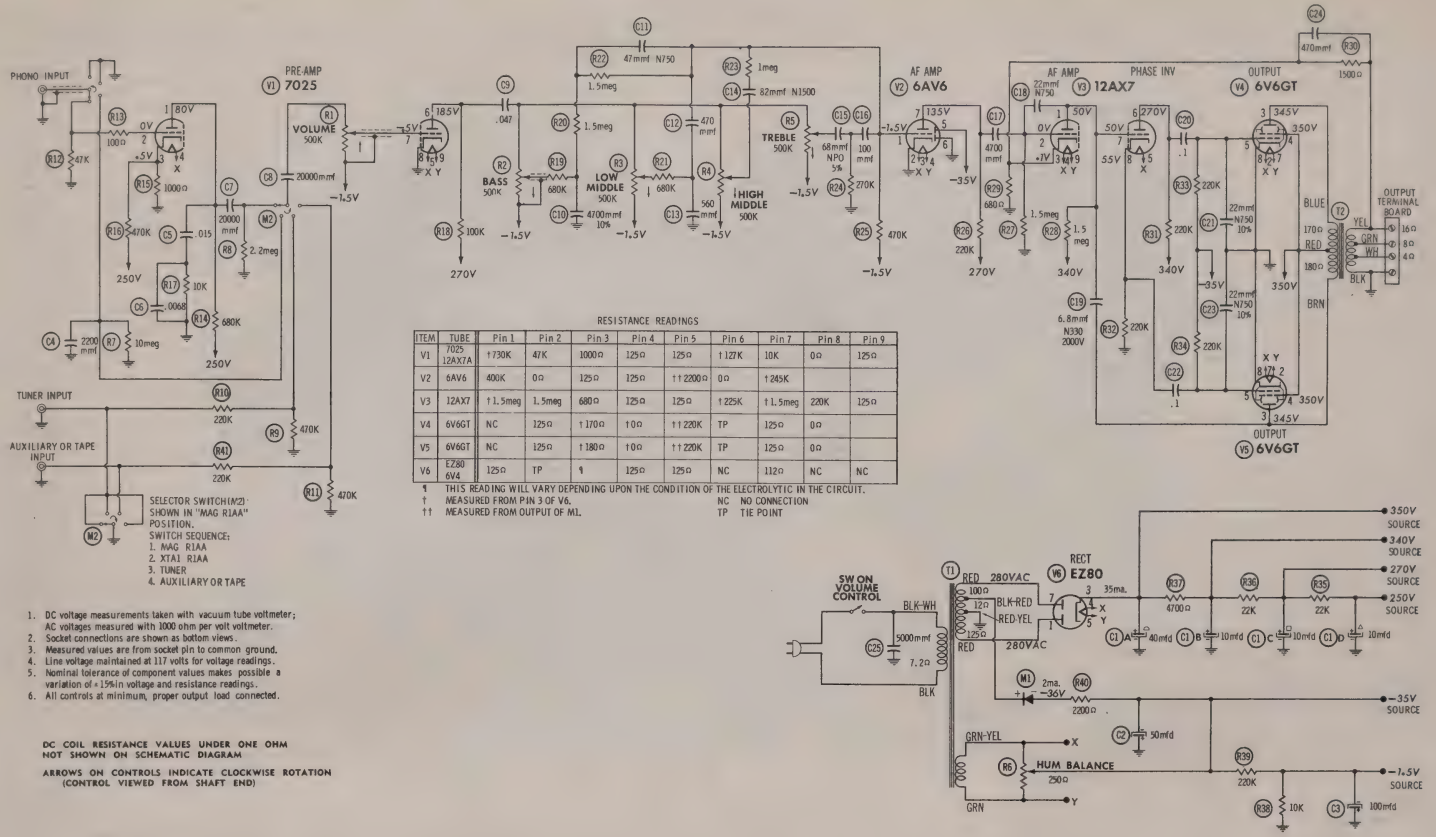
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

BLONDER-TONGUE
MODEL A-1B

FOLDER 5



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025 12AX7A	†730K	47K	1000Ω	125Ω	125Ω	†127K	10K	0Ω	125Ω
V2	6AV6	400K	0Ω	125Ω	125Ω	††2200Ω	0Ω	†245K		
V3	12AX7	†1.5meg	1.5meg	680Ω	125Ω	125Ω	†225K	†1.5meg	220K	125Ω
V4	6V6GT	NC	125Ω	†170Ω	†0Ω	††220K	TP	125Ω	0Ω	
V5	6V6GT	NC	125Ω	†180Ω	†0Ω	††220K	TP	125Ω	0Ω	
V6	EZ80 6V4	125Ω	TP	¶	125Ω	125Ω	NC	112Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V6.
†† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

BLONDER-TONGUE MODEL A-1B

PHOTOFACT® Folder with CIRCUITRACE®

COLUMBIA
MODELS 400B, G, R

TRADE NAME	Columbia Models 400B, 400G, 400R
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 — 1605KC RATING 13MA@9 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4.... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A5, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side to antenna jack. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3	Adjust for maximum output.
2.	Loop	640KC	640KC	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1240KC	1240KC	"	A5	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	640KC	640KC	"	A6	Adjust for maximum output.
5.	"	1240KC	1240KC	"	A7	Adjust for maximum output. Repeat Steps 4 and 5.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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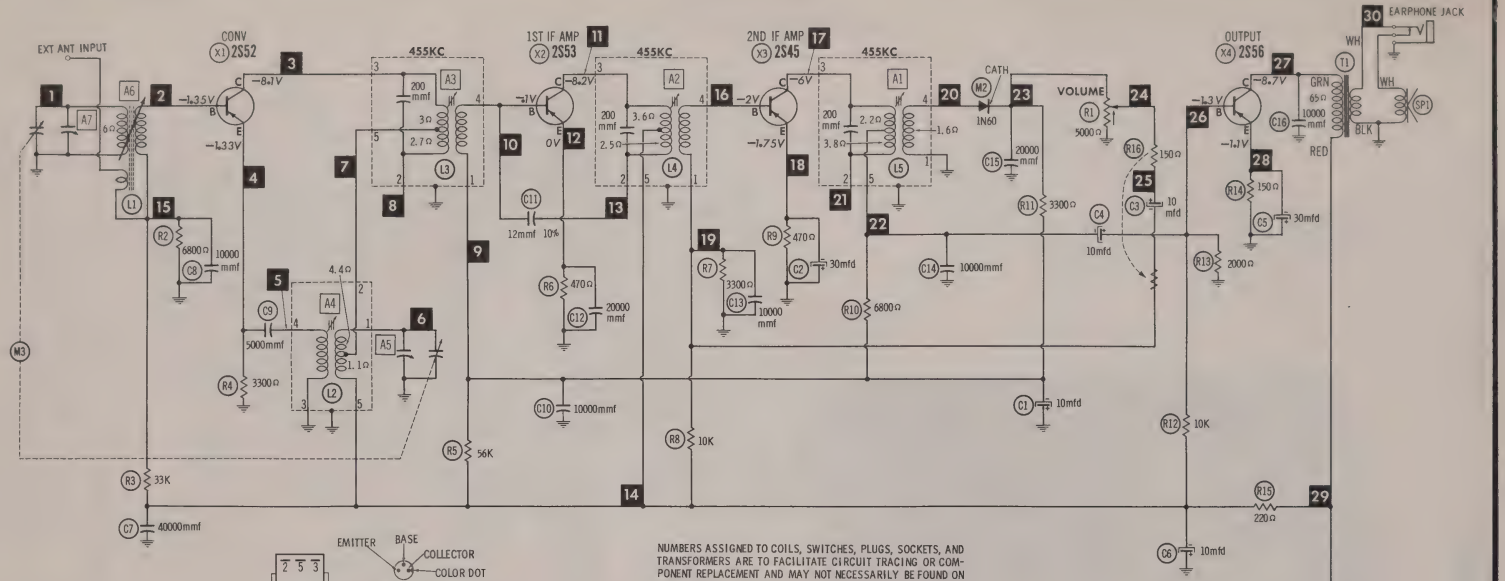
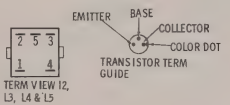
KF068

COLUMBIA
MODELS 400B, G, R

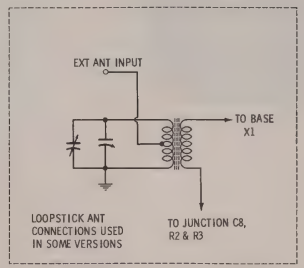
COLUMBIA
MODELS 400B, G, R

SET 507 FOLDER 6





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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COLUMBIA
MODELS 400B, G, R

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52	Converter	2N412	2N486	2N412	PNP
X2	2S53	1st IF Amplifier	2N410	2N483	2N410	PNP
X3	2S45	2nd IF Amp. -AF Amp.	2N410	2N483	2N410	PNP
X4	2S56	Output	2N408	2N632	2N408	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	3			NLW10-3	TT3X10	ML10-6	TE-1053	
C2	30	3		PTT3030	NLW30-6	TT6X30	ML30-3	TE-1092	
C3	10	3			NLW10-3	TT3X10	ML10-6	TE-1053	
C4	10	10			NLW10-10	TT12X10	ML10-12	TE-1114	
C5	30	3		PTT3030	NLW30-6	TT6X30	ML30-3	TE-1092	
C6	10	10			NLW10-10	TT12X10	ML10-12	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	40000						TA-110	TG-S10	
C8	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C9	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50	
C10	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C11	12 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12	
C12	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C13	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C14	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C15	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C16	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	9H645	B16-214				Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	6800Ω	
R3	33K	
R4	3300Ω	
R5	56K	
R6	470Ω	

ITEM No.	RATING	REMARKS
R7	3300Ω	
R8	10K	
R9	470Ω	
R10	6800Ω	
R11	3300Ω	

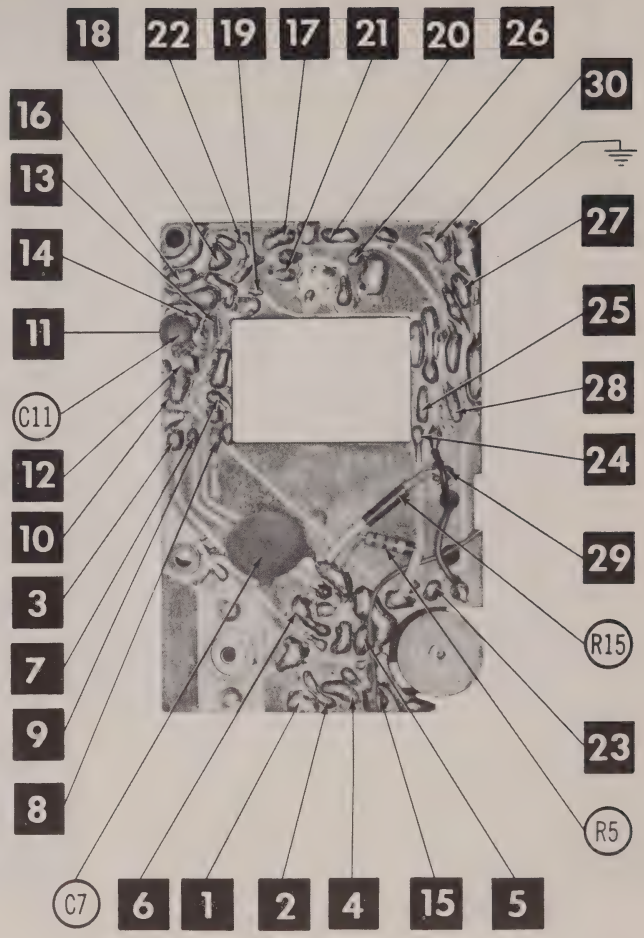
ITEM No.	RATING	REMARKS
R12	10K	
R13	2000Ω	
R14	150Ω	
R15	220Ω	
R16	150Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		COLUMBIA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	20H365					
L2	Osc. Coil	20H363					
L3	1st IF Trans.	20H371					
L4	2nd IF Trans.	20H372					
L5	3rd IF Trans.	20H373					

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	COLUMBIA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3200Ω	8-10Ω	3H255						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	2 1/4"	PM	8-10Ω	1H162	22A06Z10	

BATTERIES

ITEM No.	VOLTAGE	COLUMBIA	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
		PART No.	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		COLUMBIA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	SD-46	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M3	Tuning Cap. Earphone	14H113 19H710	2 Gang

CABINETS & CABINET PARTS

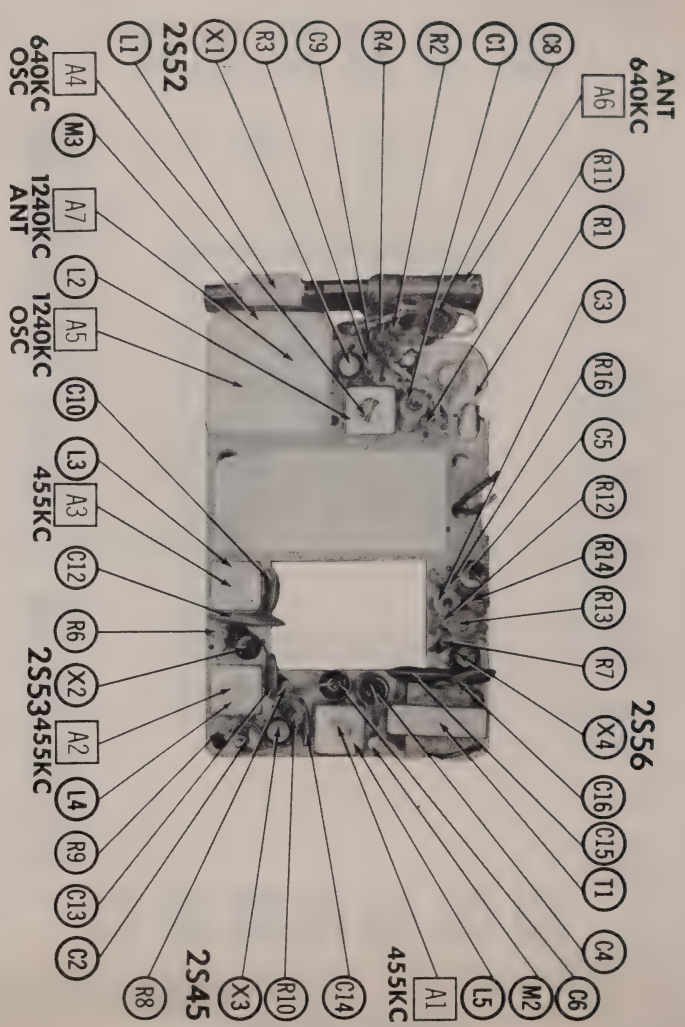
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8H524	Tuning
Knob	8H525	Volume
Cabinet	17H887	Black
Cabinet	17H888	Red
Cabinet	17H889	Gray

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

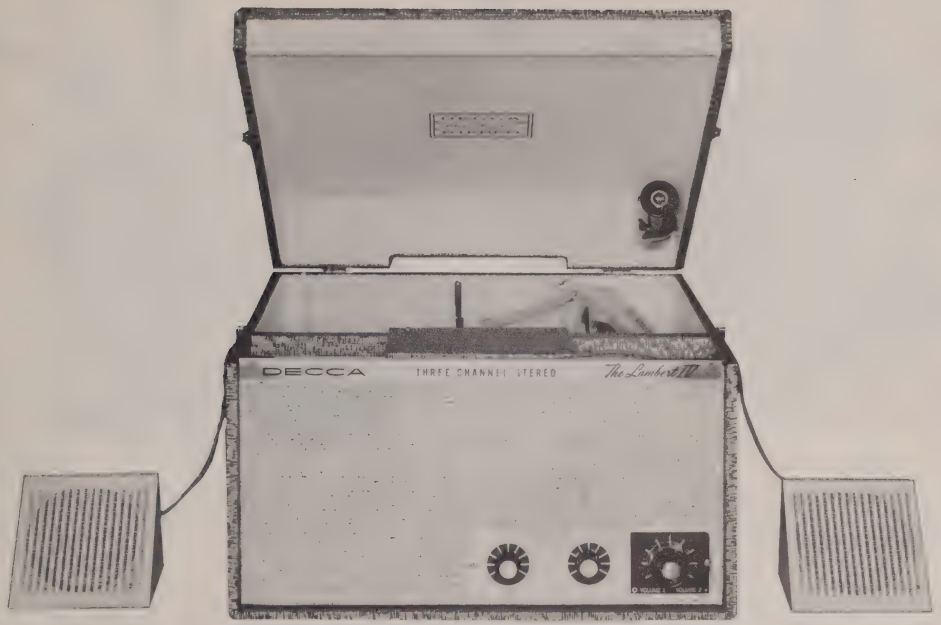
CHASSIS—TOP VIEW



PHOTOFACT® Folder

DECCA
MODEL DP-238

DECCA
MODEL DP-238



DECCA
MODEL DP-238

TRADE NAME	Decca Model DP-238
MANUFACTURER	Decca Distributing Corp., 445 Park Ave., New York 22, N. Y.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 28 Watts, .29 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12

SET 507 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KT224

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7A
V2	Channel 1 Output	50EH5
V3	Channel 2 Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	DECCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PR4-800	BBRT84215	WQ410	TDLT-7	TVAS-3457 *	
B	80	150							
C	20	150							
C2	100	25NP		PRS7340	BRI0015	TCN425		TVANS-1207.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

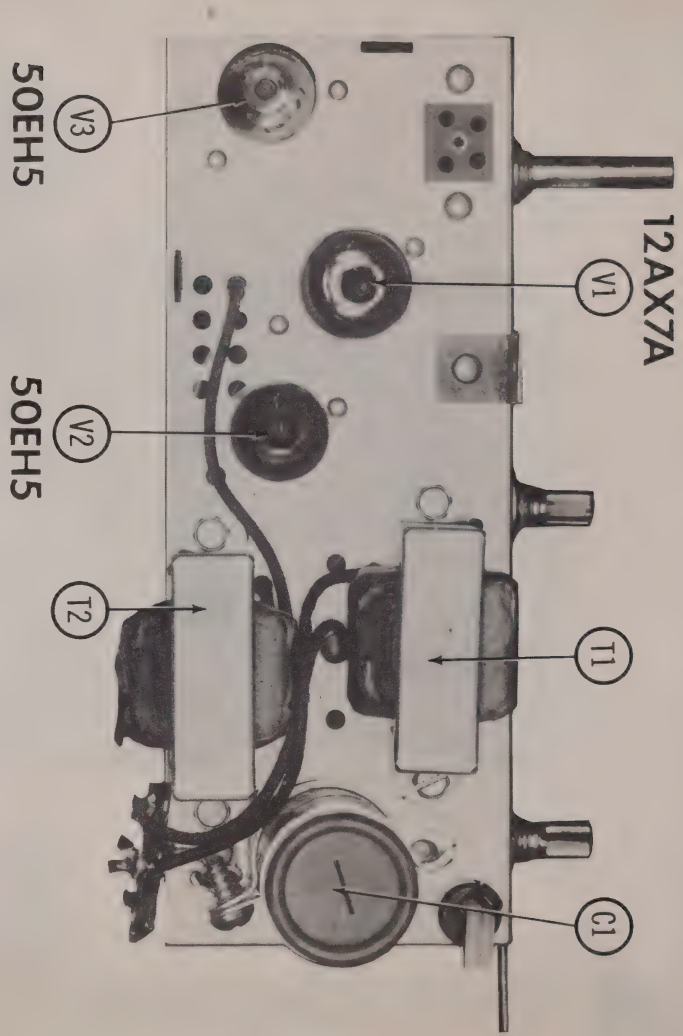
ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-503	GEM-4147	4TM-S47
C4	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	3000		BPD-003	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	560	(470) †	DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	3000		BPD-003	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	560	(560) †	DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C17	.05 400V	Note 1	P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

Note 1. Not used in some versions.
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	DECCA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg 900K Tap	½	368075					Volume, Channel 1
B	3.25meg 900K Tap	½						Volume, Channel 2
R2A	5meg	½	368036	B-88	AD47-5meg-S		FA56A	Bass, Channel 1
B	5meg	½		SR-88	Not Req.		RU56A	Bass, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	250K	½	368035	B-50	AD47-250K-S		FA254L	Treble, Channel 1
B	250K	½		SR-50	Not Req.		RU254L	Treble, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	220K	
R6	100K	
R7	6.8meg	
R8	100K	
R9	470K	

ITEM No.	RATING	REMARKS
R10	68Ω	
R11	100K	
R12	220K	
R13	100K	
R14	6.8meg	
R15	100K	

ITEM No.	RATING	REMARKS
R16	470K	
R17	68Ω	
R18	2200Ω 1W	
R19	125Ω 5W	IRC#PW5-125Ω
R20	47Ω 5W	IRC#PW5-47Ω
R21	47Ω 5W	IRC#PW5-47Ω

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DECCA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	7000Ω	3-4Ω		A-2900	AU-608	A-3850	24S04	S-51X	
T2	7000Ω	3-4Ω		A-2900	AU-608	A-3850	24S04	S-51X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DECCA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		4A07	
SP2	6"	PM	3-4Ω		6A21	
SP3	4"	PM	3-4Ω		4A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	DECCA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.080A			1N1764	2F4	SR200	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	DECCA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		80TS	N7-7 N8-3	96T				8TA4-S	

PHONO NEEDLE

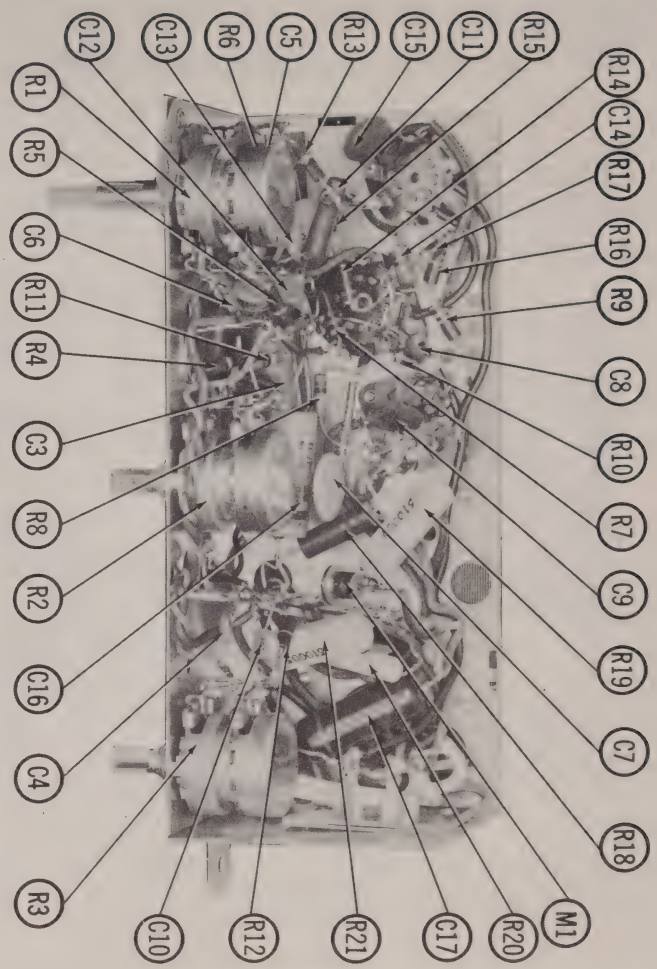
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

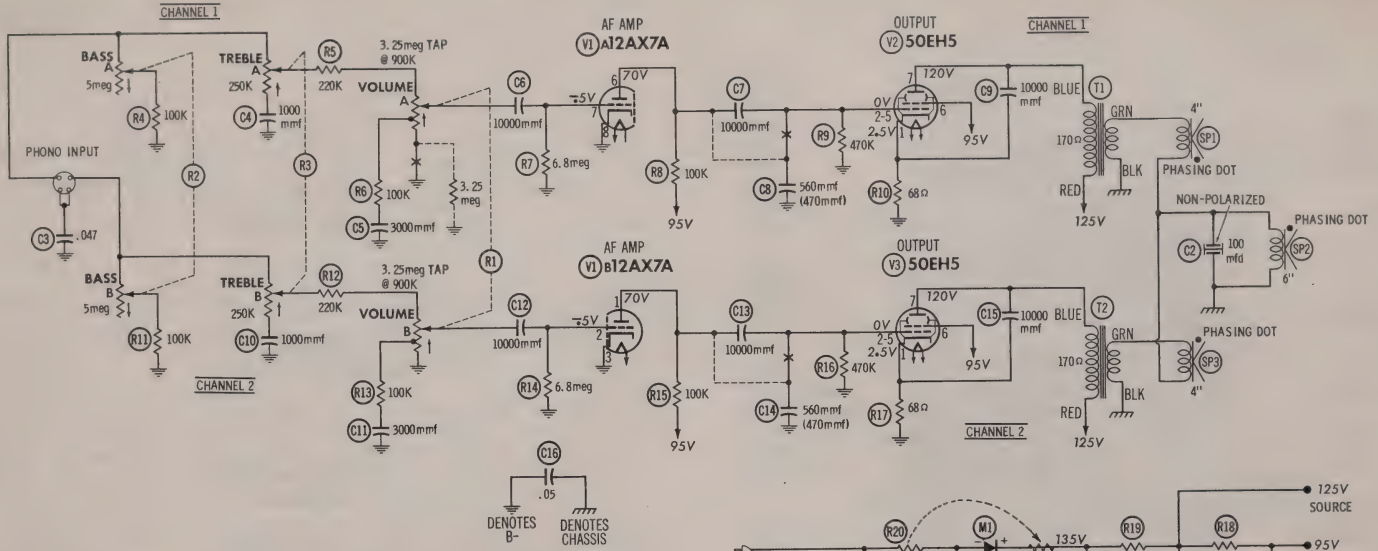
ITEM No.	REPLACEMENT DATA		REMARKS
	DECCA PART No.	JENSEN PART No.	
M3		CRA55X † or CRA-55XD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	DECCA PART No.	NOTES
M4	Switch		Off-On (Part of Changer)
M5	Motor		Turntable Drive (Part of Changer)

CHASSIS—BOTTOM VIEW

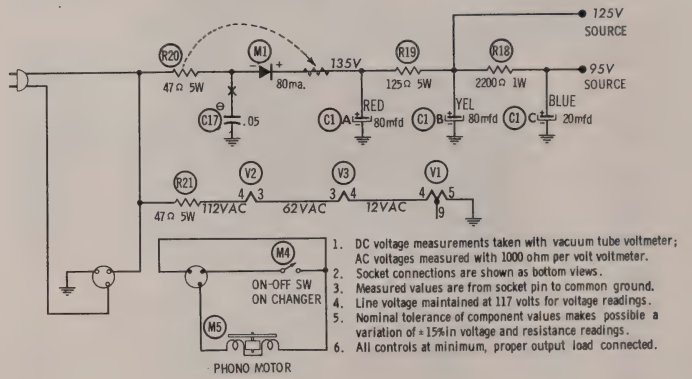




RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†100K	6.8meg	0Ω	15Ω	0Ω	†100K	6.8meg	0Ω	NC
V2	50EH5	68Ω	470K	75Ω	130Ω	470K	†2300Ω	†295Ω		
V3	50EH5	68Ω	NC	75Ω	15Ω	470K	†2300Ω	†295Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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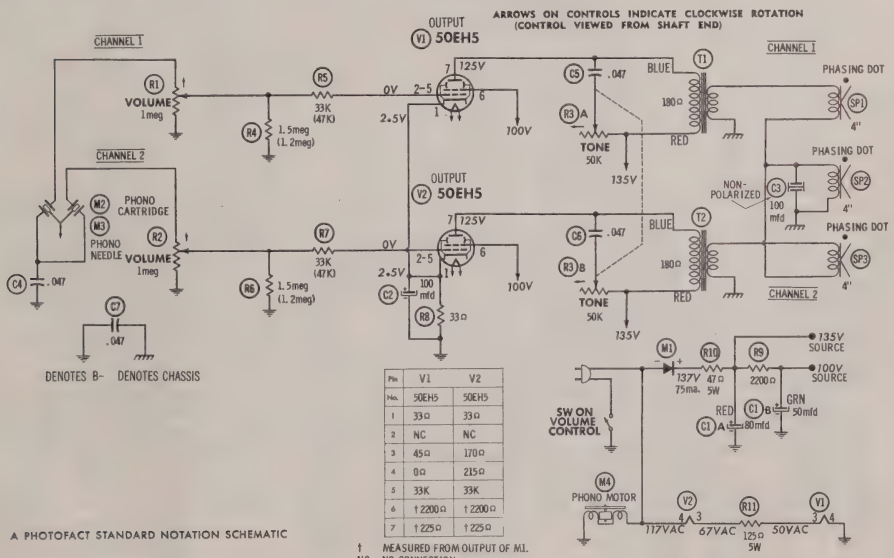
DECCA
MODEL DP-238

PHOTOFACT® Folder

DECCA
MODEL DP-588

DECCA
MODEL DP-588

TRADE NAME	Decca Model DP-588
MANUFACTURER	Decca Distributing Corp., 445 Park Ave., New York 22, N. Y.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier With 3 Speed Manual Record Player
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 28 Watts, .3 Amp. @ 117 Volts AC (Less Motor)



Pin No.	V1 50EH5	V2 50EH5
1	33Ω	33Ω
2	NC	NC
3	45Ω	170Ω
4	0Ω	215Ω
5	33K	33K
6	↑2200Ω	↑2200Ω
7	↑225Ω	↑225Ω

A PHOTOFACT STANDARD NOTATION SCHEMATIC

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

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SET 507 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 Output	50EH5	V2	Channel 2 Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DECCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	100	10		SRE12V100	BBR100-15	TC2501	TD-100-15	TVA-1130	
C3	100	25NP		PRS7340	BRI0015	TCN425		TVANS-1207.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DECCA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	360080	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	360081	B-70-S	A47-1meg-Z	Q13-137	U53	Volume, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	
R3A	50K	½	368064	B-32	AD47-50K-S		FB54A	Tone, Channel 1
B	50K	½		SR-32	Not Req.		RU54A	Tone, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1.5meg	(1.2meg) *
R5	33K	(47K) *
R6	1.5meg	(1.2meg) *

ITEM No.	RATING	REMARKS
R7	33K	(47K) *
R8	33Ω	
R9	2200Ω	

ITEM No.	RATING	REMARKS
R10	47Ω 5W	IRC#PW5-47Ω
R11	125Ω 5W	IRC#PW5-125Ω

* Alternate Value.

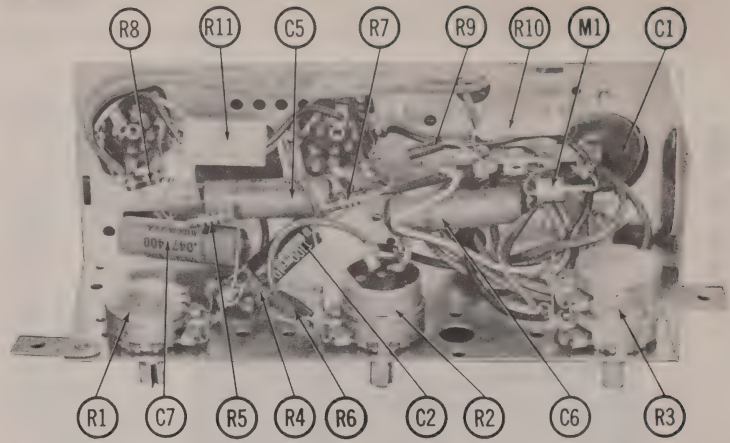
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA DECCA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω	3-4Ω		A-2900	AU-609	A-3856	24S48	S-51X	
T2	4000Ω	3-4Ω		A-2900	AU-609	A-3856	24S48	S-51X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA DECCA PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω		4A07	
SP2	4"	PM	3-4Ω		4A07	
SP3	4"	PM	3-4Ω		4A07	

CHASSIS—BOTTOM VIEW



RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA DECCA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.075A			1N1763	2F4	SR200	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA DECCA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		70-TS-TB		96T		49		12TH-S	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA DECCA PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M3			

MISCELLANEOUS

ITEM No.	PART NAME	DECCA PART No.	NOTES
M4	Motor Idler Wheel		Turntable Drive, (Part of Player) Walsco Part No. 1490-01

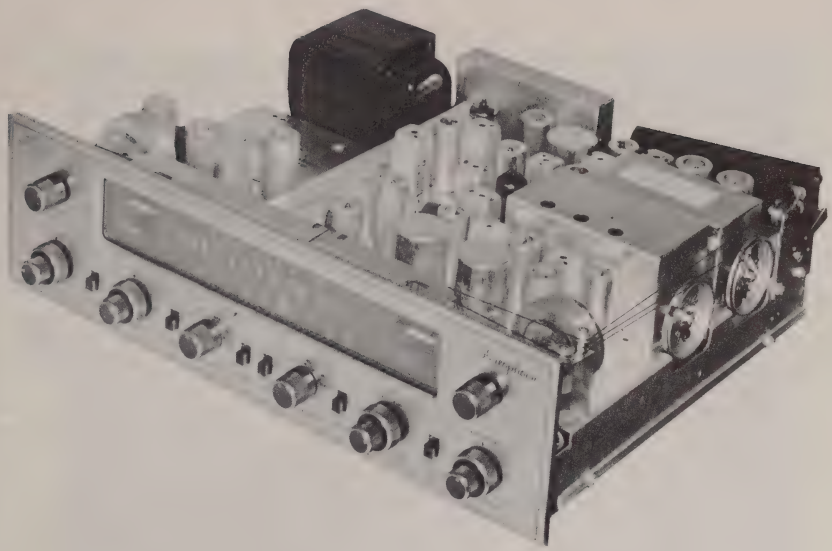
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

FISHER
MODEL 202-T

FISHER
MODEL 202-T



FISHER
MODEL 202-T

TRADE NAME	Fisher Model 202-T (Serial #30001-39999 Inclusive)
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated 21 Tube FM-AM Receiver With Stereo Amplifier
POWER SUPPLY	105 - 120 Volts AC, 50-60 Cycles RATING 95 Watts, .88 Amp. @117 Volts AC
TUNING RANGES — BROADCAST	540 — 1600KC FREQ. MOD. 88 — 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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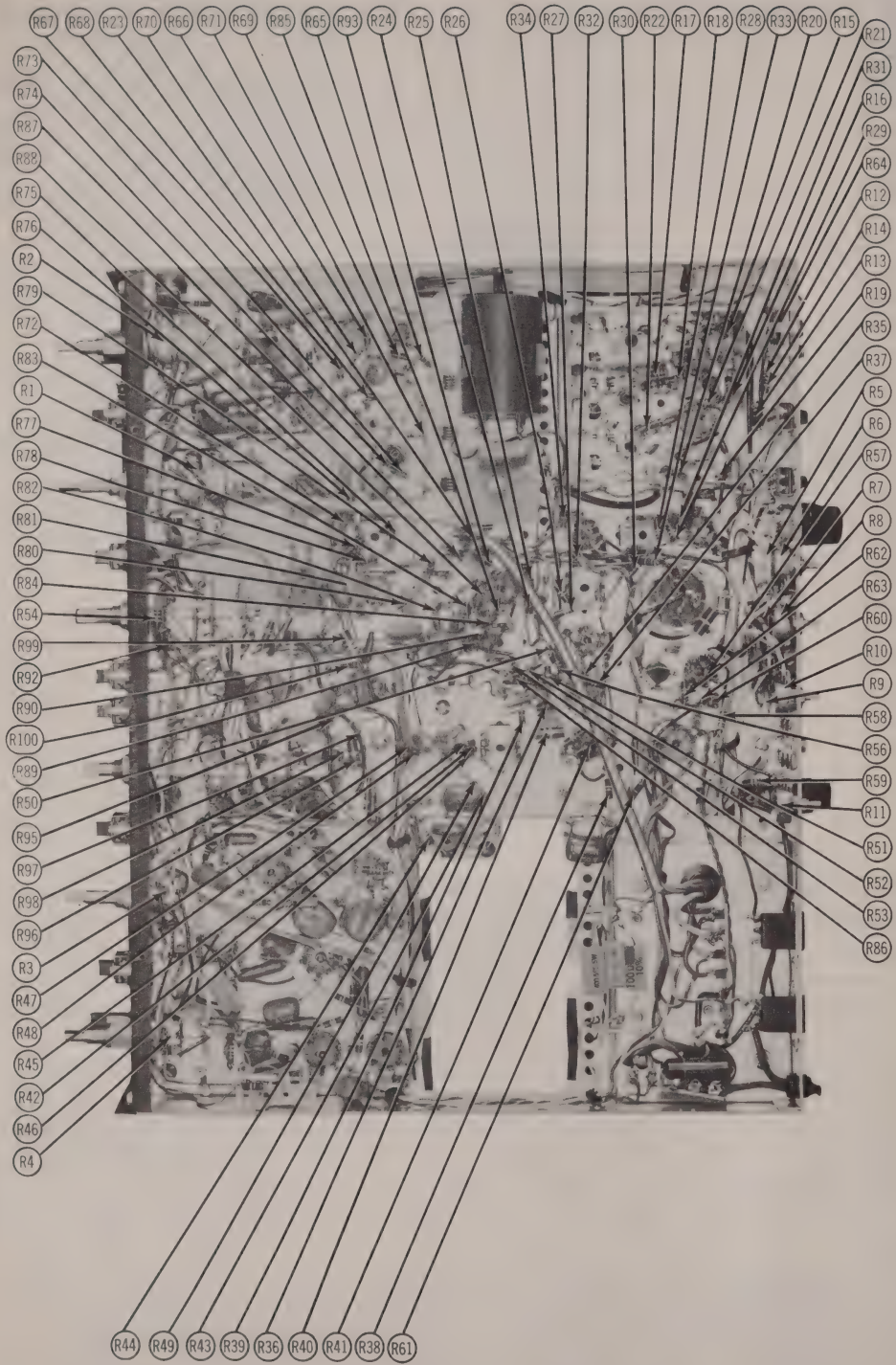
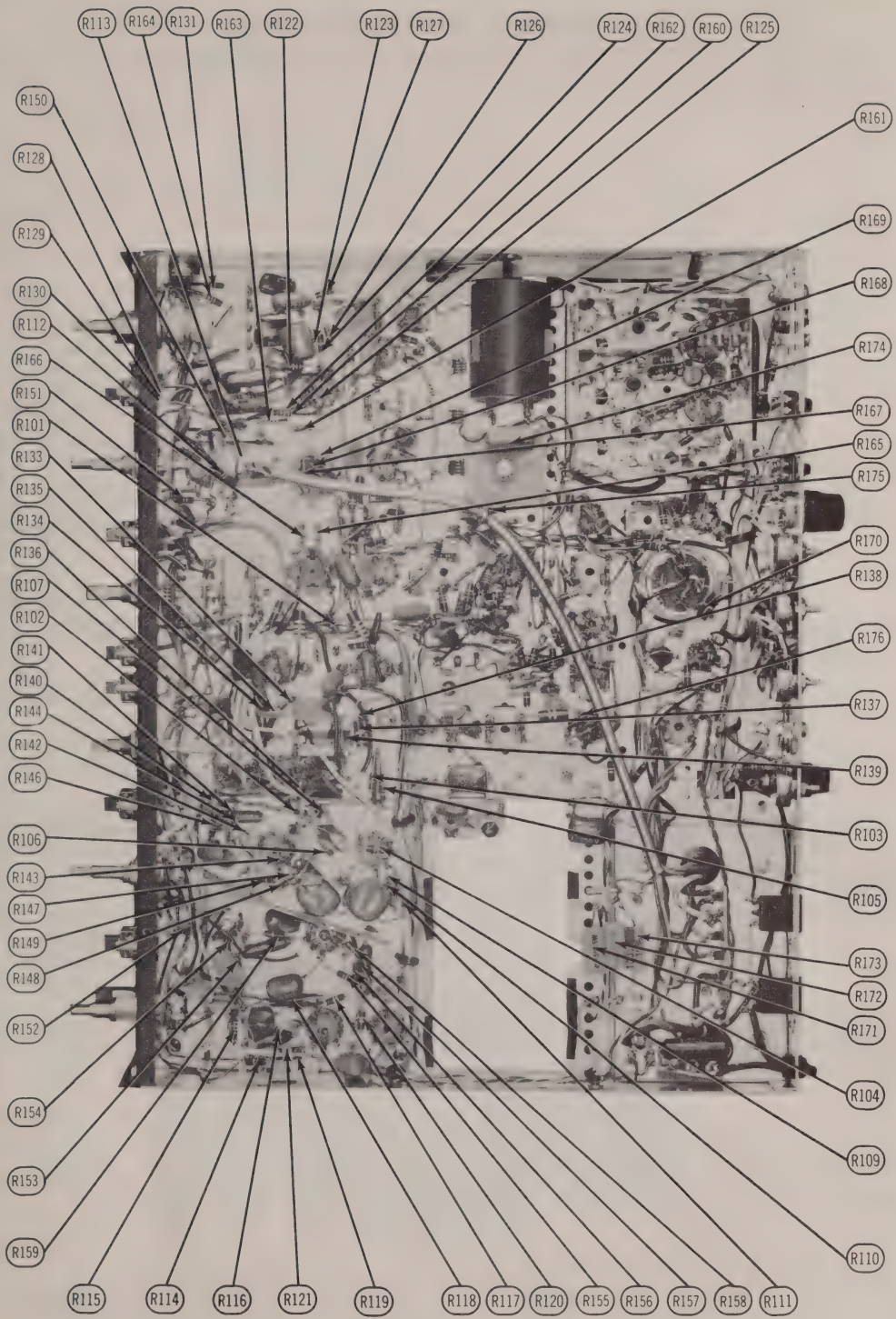


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1, A25, A26, A27	GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722 9150, 9298, WALSCO #2516, 2518, 2519
A2 Thru A7, A9, A16 thru A21.....	GENERAL CEMENT #5097, 8727 WALSCO #2515
A8, A13, A14, A15, A22, A23, A24....	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A10, A11, A12.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side of Audio generator to pin 7 (plate) of AM detector. Low side to chassis.	10KC	(AM) Point of non-interference. (AM Bandwidth at "SHARP".)	AC probe channel "B" RCDR. output jack.	A1	Adjust for MINIMUM deflection.
2.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ AM)	"	DC probe to point Ⓐ. Common to chassis.	A2, A3, A4, A5, A6, A7	Adjust for maximum deflection.
3.	"	455KC (30KC Swp.)	Point of non-interference. (AM Bandwidth at "BROAD".)	USE SCOPE Connect across Ch. "B" RCDR. Output jack.		Retouch A2 for symmetry of response.
4.	High side thru 220mmf to AM antenna terminal #3. Low side to chassis.	600KC (400∿ AM)	600KC	Scope as above. DC probe of VTVM to point Ⓐ. Common to chassis.	A8, A9	Check for sine wave. Adjust for maximum deflection on VTVM.
5.	"	1400KC	1400KC	"	A10, A11 A12	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

FM Muting Switch Off.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .01mfd to pin 1 (grid) of 2nd FM IF. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A13, A14, A15	Adjust for maximum deflection.
7.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A14	Readjust A14 for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	High side to ungrounded tube shield floating over FM Mixer- Osc. Low side to chassis.	"	"	DC probe to point Ⓓ. Common to chassis.	A16, A17, A18, A19, A20, A21	Adjust for maximum deflection.

FIG. 1

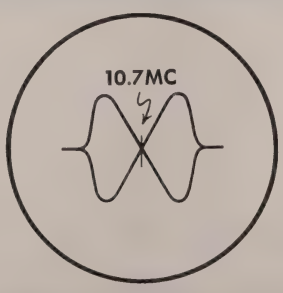


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

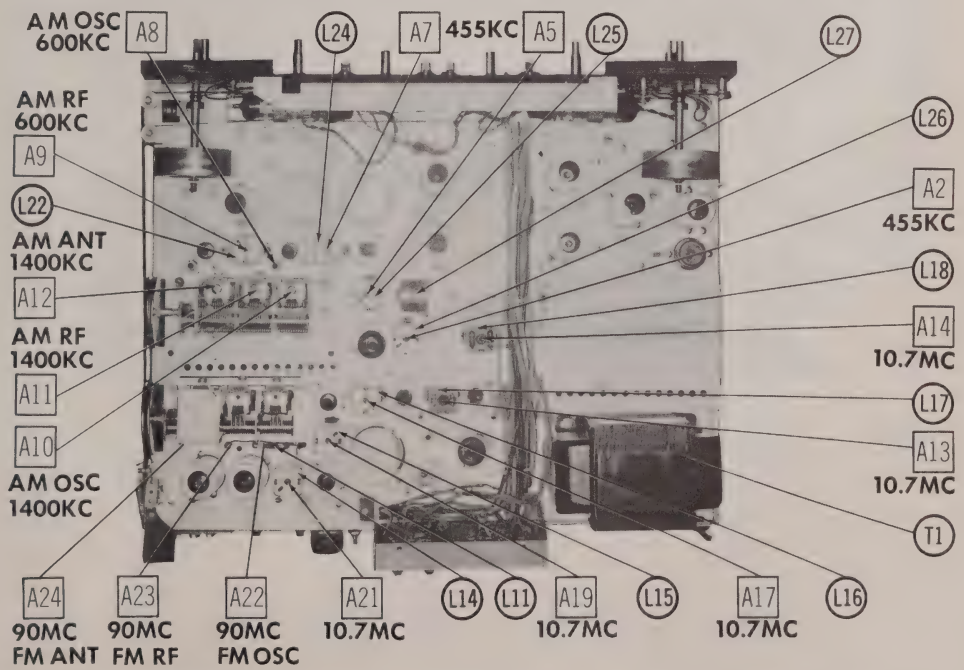
FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
FM Muting Switch Off.

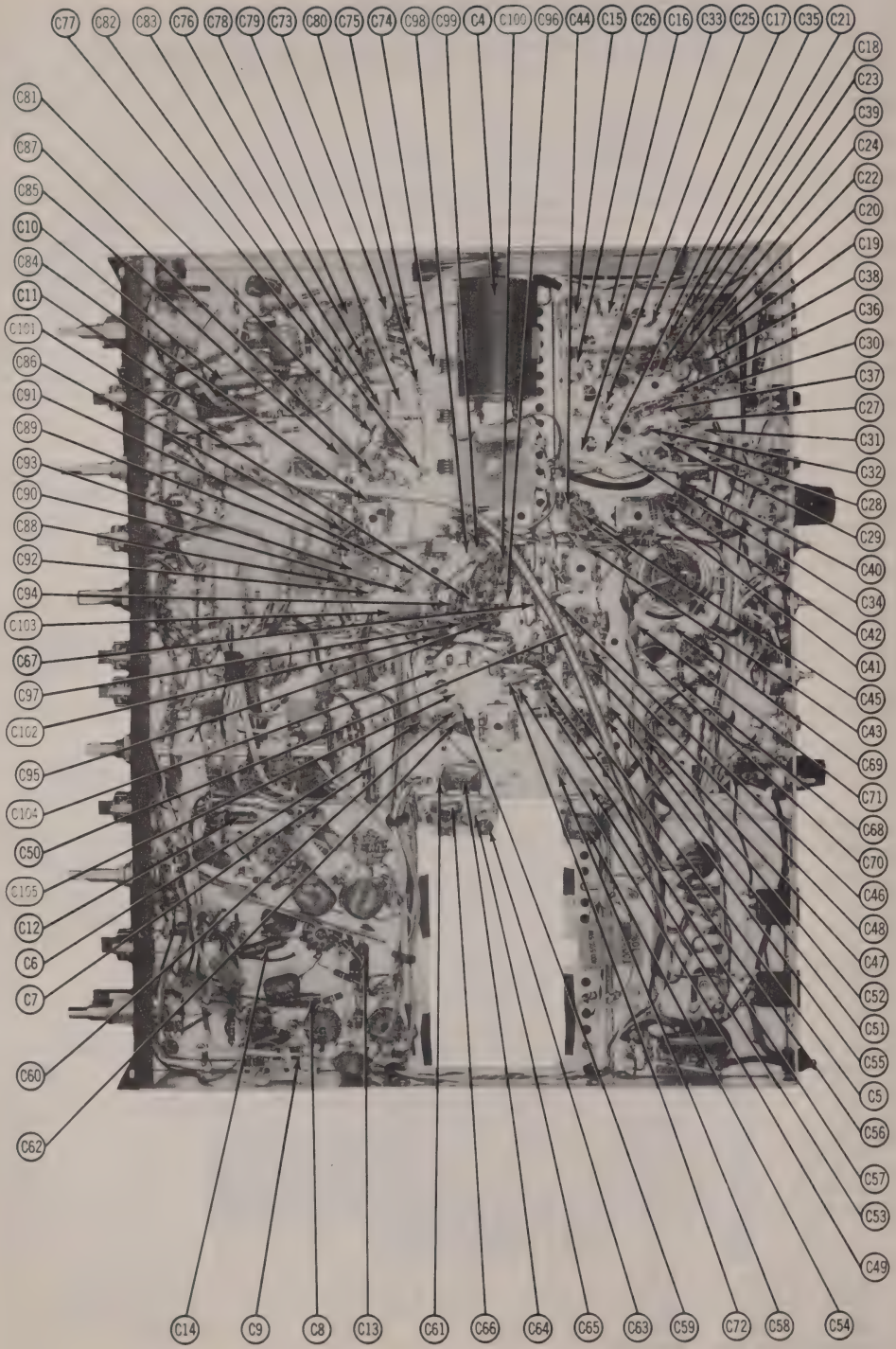
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side thru .01mfd to pin 1 (grid) of 2nd FM IF. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. Amp. to point Ⓑ. Low side to chassis.	A13, A14, A15	Disconnect stabilizing capacitor C6. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C6.
7.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A15 for maximum amplitude and straightness of cross-over lines.
8.	High side to ungrounded tube shield floating over FM Mixer-Osc. Low side to chassis.	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A16, A17, A18, A19, A20, A21	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

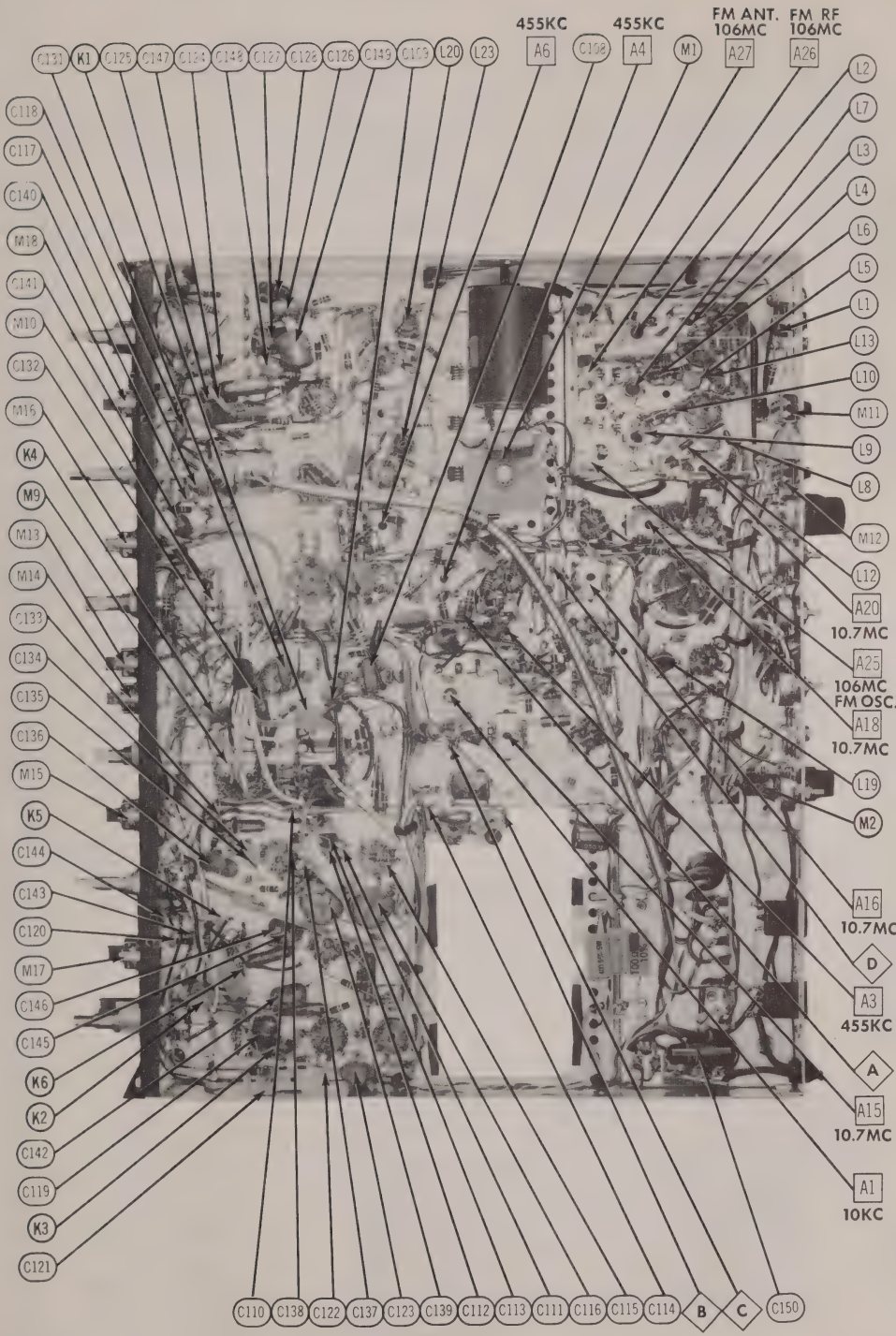
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals #5 & 6 with 120Ω in each lead.	90MC (22.5MC Swp)	(FM) 90MC	DC probe to point Ⓓ. Common to chassis. Scope across Ch. "A" RCDR. output jack.	A22, A23 A24	Check for sine wave. Adjust for maximum deflection on VTVM.
10.	"	106MC	106MC	"	A25, A26 A27	Check for sine wave. Adjust for maximum deflection on VTVM. Repeat Steps 9 and 10.



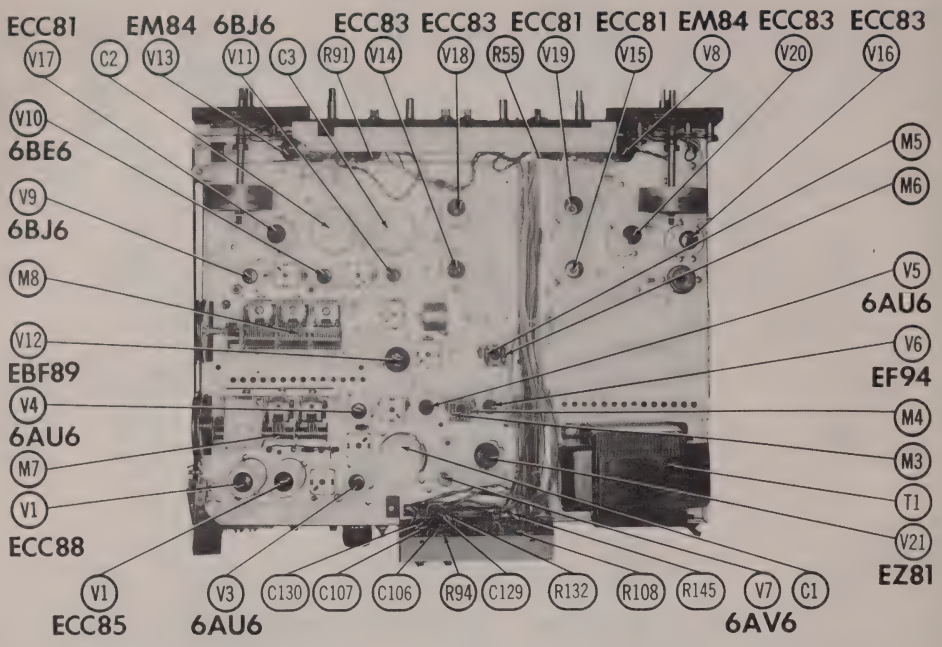
CHASSIS TOP VIEW-INDUCTOR & ALIGN. IDENT



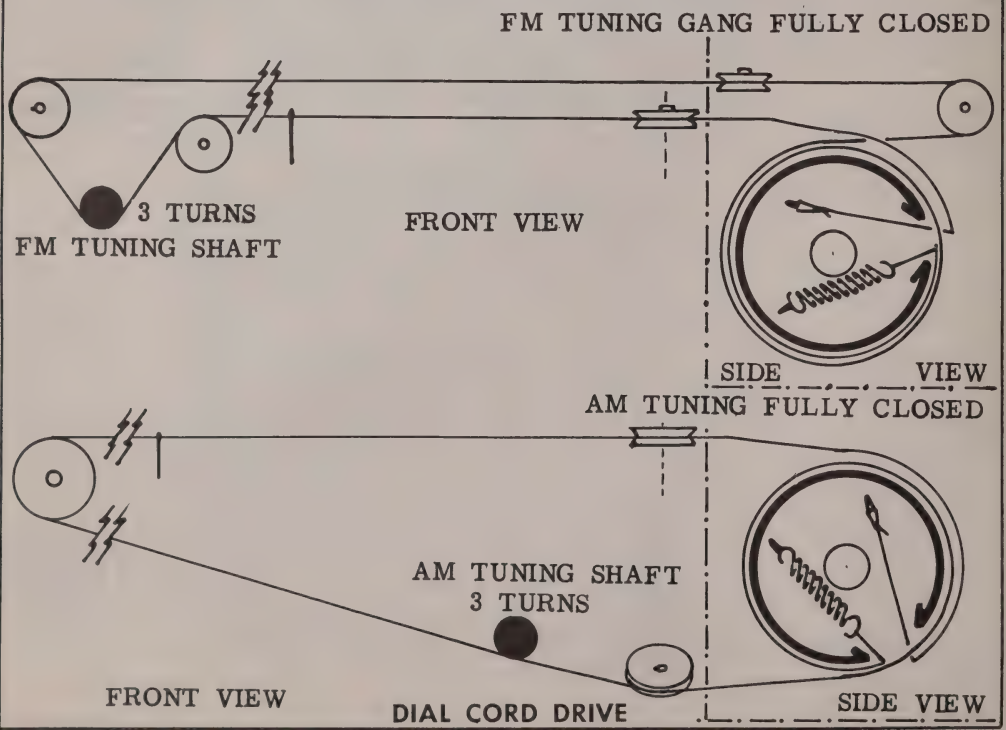
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

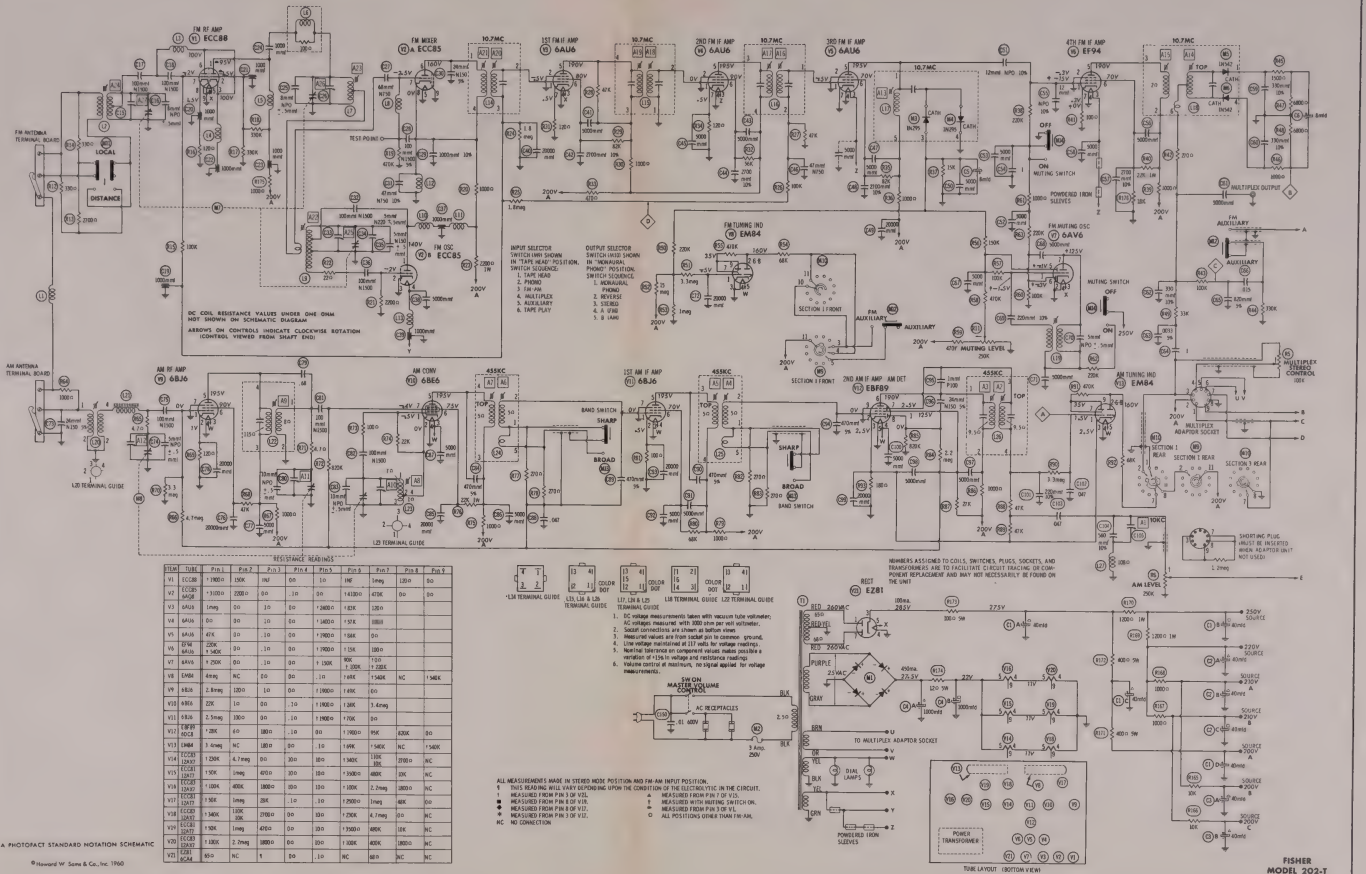


CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS TOP VIEW




FM RF AMP V1 ECC88
FM MIXER V2a ECC85
1ST FM IF AMP V3 6AU6
2ND FM IF AMP V4 6AU6
3RD FM IF AMP V5 6AU6
4TH FM IF AMP V6 EF94
10.7MC
FM OSC V2b ECC85
FM TUNING IND V7 EM84
FM MUTING OSC V8 6AV6
MUTING SWITCH
ON MUTING SWITCH
POWERED FROM SLEEVES
MULTIPLEX OUTPUT
FM AUXILIARY
AUXILIARY
FM ANTENNA TERMINAL BOARD
LOCAL
DISTANCE
TEST POINT C
INPUT SELECTOR SWITCH (WH SHOWN IN "TAPE HEAD" POSITION. SWITCH SEQUENCE: 1. TAPE HEAD 2. PHONO 3. FM-AM 4. MULTIPLEX 5. AUXILIARY 6. TAPE PLAY
OUTPUT SELECTOR SWITCH (AS SHOWN IN "MONAURAL PHONO" POSITION. SWITCH SEQUENCE 1. MONAURAL PHONO 2. REVERSE 3. STEREO 4. A UNIT 5. B UNIT
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
SECTION 1 FRONT
SECTION 2 FRONT
AM ANTENNA TERMINAL BOARD
AM RF AMP V9 6BJ6
AM CONV V10 6BE6
1ST AM IF AMP V11 6BJ6
2ND AM IF AMP AM DET V12 EBF89
AM TUNING IND V13 EM84
455KC
BAND SWITCH
SHARP
BROAD
MULTIPLEX STEREO CONTROL 100K
MULTIPLEX ADAPTOR SOCKET
SECTION 1 REAR
SECTION 2 REAR
SHORTING PLUG MUST BE INSERTED WHEN ADAPTOR UNIT NOT USED
AM LEVEL 250K
L25 TERMINAL GUIDE
L20 TERMINAL GUIDE
L18 TERMINAL GUIDE
L17, L18 & L25 TERMINAL GUIDE
L18 TERMINAL GUIDE
L22 TERMINAL GUIDE
L24 TERMINAL GUIDE
L23, L24 & L26 TERMINAL GUIDE
COLOR DOT
RESISTANCE READINGS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
RECT V20 EZ81
105ea. 265V
275V
RED 260VAC
YELLOW
PURPLE
GRAY
250V SOURCE
220V SOURCE
SOURCE 210V A
SOURCE 210V B
SOURCE 210V C
SOURCE 210V D
SOURCE 200V A
SOURCE 200V B
SW ON MASTER VOLUME CONTROL
AC RECEPTACLES
3 Amp. 250V
TO MULTIPLEX ADAPTOR SOCKET
DIAL LAMPS
POWERED FROM SLEEVES
POWER TRANSFORMER
TUBE LAYOUT (BOTTOM VIEW)
ALL MEASUREMENTS MADE IN STEREO MODE POSITION AND FM-AM INPUT POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 3 OF V3L.
■ MEASURED FROM PIN 8 OF V3R.
◆ MEASURED FROM PIN 8 OF V12.
* MEASURED FROM PIN 3 OF V12.
NC NO CONNECTION
▲ MEASURED FROM PIN 7 OF V13.
‡ MEASURED WITH MUTING SWITCH ON.
● MEASURED FROM PIN 3 OF V1.
○ ALL POSITIONS OTHER THAN FM-AM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC88	* 1900Ω	150K	INF	0Ω	1Ω	INF	1meg	120Ω	0Ω
V2	ECC85 6AQ8	* 1300Ω	200Ω	0Ω	.1Ω	0Ω	1413Ω	475K	0Ω	0Ω
V3	6AU6	1meg	0Ω	1Ω	0Ω	* 240Ω	* 82K	120Ω		
V4	6AU6	0Ω	0Ω	.1Ω	0Ω	* 140Ω	* 51K	88Ω		
V5	6AU6	47K	0Ω	.1Ω	0Ω	* 190Ω	* 84K	0Ω		
V6	EF94	330K	0Ω	.1Ω	0Ω	* 190Ω	* 15K	180Ω		
V7	6AV6	* 340K	0Ω	.1Ω	0Ω	* 190Ω	* 15K	180Ω		
V8	EM84	4meg	NC	0Ω	0Ω	.1Ω	* 68K	* 540K	NC	* 54K
V9	6BJ6	2.8meg	120Ω	1Ω	0Ω	* 190Ω	* 69K	0Ω		
V10	6BE6	22K	1Ω	0Ω	.1Ω	* 190Ω	* 38K	3.4meg		
V11	6BJ6	2.5meg	130Ω	0Ω	.1Ω	* 190Ω	* 70K	0Ω		
V12	EBF89 6DC8	* 28K	6.0	180Ω	.1Ω	0Ω	* 190Ω	95K	820K	0Ω
V13	EM84	3.4meg	NC	180Ω	0Ω	.1Ω	* 69K	* 540K	NC	* 540K
V14	ECC83 12AX7	* 230K	4.7meg	0Ω	30Ω	18Ω	* 340K	100K 30K	270Ω	NC
V15	ECC83 12AT7	* 95K	1meg	470Ω	30Ω	18Ω	* 330Ω	480K	33K	NC
V16	ECC85 12AX7	* 100K	400K	1800Ω	30Ω	13Ω	* 100K	2.2meg	180Ω	NC
V17	ECC83 12AT7	* 96K	1meg	28K	.1Ω	.1Ω	* 250Ω	1meg	48K	0Ω
V18	ECC83 12AX7	* 340K	100K 30K	270Ω	0Ω	13Ω	* 230K	4.7meg	0Ω	NC
V19	ECC83 12AT7	* 92K	1meg	470Ω	0Ω	13Ω	* 330Ω	480K	18K	NC
V20	ECC83 12AX7	* 120K	2.2meg	1800Ω	0Ω	13Ω	* 100K	480K	180Ω	NC
V21	EZ81 6CA4	95Ω	NC	¶	0Ω	.1Ω	NC	66Ω	NC	NC

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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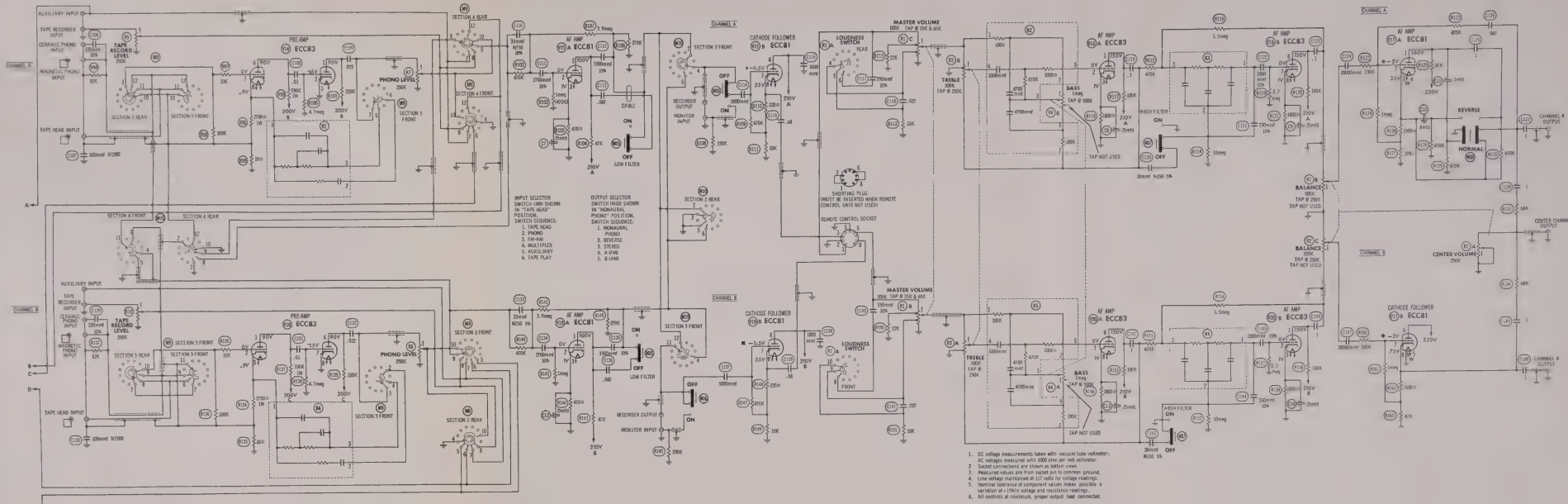
FISHER MODEL 202-T



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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FISHER
MODEL 202-T

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •	
V1	FM RF Amplifier	ECC88 (6DJ8) *	V13	AM Tuning Indicator	EM84 (6FG6) *
V2	FM Mixer-FM Osc.	ECC85/6AQ8	V14	Channel A Preamp.	ECC83/12AX7
V3	1st FM IF Amplifier	6AU6	V15	Channel A AF Amp. - Channel A Cath. Follower	ECC81/12AT7
V4	2nd FM IF Amplifier	6AU6	V16	Channel A AF Amp.	ECC83/12AX7
V5	3rd FM IF Amplifier	6AU6	V17	Channel A AF Amp. - Channel B Cath. Follower	ECC81/12AT7
V6	4th FM IF Amplifier	EF94/6AU6	V18	Channel B Preamp.	ECC83/12AX7
V7	FM Muting Osc.	6AV6	V19	Channel B AF Amp. - Channel B Cath. Follower	ECC81/12AT7
V8	FM Tuning Indicator	EM84 (6FG6) *	V20	Channel B AF Amp.	ECC83/12AX7
V9	AM RF Amplifier	6BJ6	V21	Rectifier	EZ81/6CA4
V10	AM Converter	6BE6			
V11	1st AM IF Amplifier	6BJ6			
V12	2nd AM IF Amp. -AM Det.	EBF89/6DC8			

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	C50180-3			FP327, 89	TMT-3337	TVLS-4581 *	
B	■40	300				TC58	TD-40-250		
C	▲40	300							
D	40	250							
C2A	▲40	250	C50180-4		B0260	FP327, 89	TMD-2315	TVL-2575	
B	▲40	250			BR4025	TC58	TD-40-250	TVA-1511	
C	■40	250							
C3A	▲40	250	C50180-5	AFH2-33	B0260	FP217, 87	TMD-2315	TVL-2575	
B	▲40	250							
C4A	▲1000	30	C50180-7						
B	■1000	30							
C5	2	70	C721-142	PRS1400	NLW2-100	TT150X2	TD-4-150	TE-1401	
C6	8	50	C629-138	PRS1320	NLW8-100	TT50X10	ML8-50	TE-1303, 3	
C7	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	
C8	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	
C9	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	
C10	8	50	C629-138	PRS1320	NLW8-100	TC41	ML8-50	TE-1303, 3	
C11	1	250	C546-126	PRS1700	BR145	TT250X1	TD-2-450	TVA-1701	
C12	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	
C13	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	
C14	25	6	C639-114	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C15		#C662-123						
C16	8 NPO ± .5mmf		NPO-SI 8, 2		C10V8C			10TCC-V82
C17	100 N1500	#C50070-6		TCL-100		*		
C18	100 N1500	#C50070-6		TCL-100		*		
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	
C20	1000		EF-001	MFT-1000		CCF-102	CT280A	
C21	1000		EF-001	MFT-1000		CCF-102	CT280A	
C22	1000		EF-001	MFT-1000		CCF-102	CT280A	
C23	1000		EF-001	MFT-1000		CCF-102	CT280A	

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C24	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C25	8 NPO ± .5mmf		NPO-SI 8, 2		C10V8C			10TCC-V82
C26		#C662-123						
C27	68 N750		N750-SI 68	TCN-68	C10Q68C	CCTN-680	CN7-468	10TCU-Q68
C28	100 N1500 5%	#C50070-19		TCL-100		*		
C29	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C30	24 N150 5%	#C50070-8				*		
C31	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	100 N1500	#C50070-6		TCL-100		*		
C33		#C662-123						
C34	5 N220 ± .5mmf	#CC20RH050D5				*		10TCR-V50
C35	5 N150 ± .5mmf	#CC20PJ050D5				*		10TCP-V50
C36	100 N1500	#C50070-6		TCL-100		*		
C37	1000		EF-001	MFT-1000		CCF-102	CT280A	
C38	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C39	1000		EF-001	MFT-1000		CCF-102	CT280A	
C40	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C41	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C43	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C44	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C45	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C46	47 N750		N750-DI 47	DTN-47	C10Q47C	CCTN-470	CN7-447	10TCU-Q47
C47	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C48	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C49	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C51	12 NPO 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C52	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C53	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C54	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C55	12 NPO 10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C56	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C57	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C58	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C59	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C60	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C61	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C62	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C63	.0033 200V 5%		V84C4D33-10%		1R5D33	6DP-1-332-J	MCJ462	MS-233
C64	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C65	820 5%				5R5T82	CM-19B-821J		MS-382
C66	.015 250V		P488N-015	DD-153	CUB6S15	4DP-1-153	GEM-415	4TM-S15
C67	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C68	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C69	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C70	5 NPO ± .5mmf		NPO-SI 5, 0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C71	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C72	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C73	24 N150 5%	#C50070-8				*		
C74	5 NPO ± .5mmf		NPO-SI 5, 0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C75	100 N1500	#C50070-5		TCL-100		*		
C76	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C77	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C78	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C79	.68		NPO-SI .68	TCZ-R68				
C80	10 NPO ± .5mmf		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C81	100 N1500	#C50070-5		TCL-100		*		
C82	100 N1500	#C50070-5		TCL-100		*		
C83	10 NPO ± .5mmf		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C84	470 5%		1469-00047		5R5T47	CM-19B-471J	MCJ244	MS-347
C85	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C86	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C87	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C88	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C89	470 5%		1469-00047		5R5T47	CM-19B-471J	MCJ244	MS-347
C90	470 5%		1469-00047		5R5T47	CM-19B-471J	CMJ244	MS-347
C91	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C92	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C93	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C94	470 5%		1469-00047		5R5T47	CM-19B-471J	MCJ244	MS-347
C95	1 P100	#C50070-1				*		
C96	24 N150 5%	#C50070-8				*		
C97	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C98	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C99	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C100	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C101	220 10%		DI-220	DD-221	Li0T22	CCD-221	GP322	10TS-T22
C102	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C103	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C104	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C105		#C629-151-5						
C106	220 10%		DI-220	DD-221	Li0T22	CCD-221	GP322	10TS-T22
C107	100 N1500	#C50070-5		TCL-100		*		
C108	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-401	4TM-S10
C109	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C110	33 N750 5%			DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C111	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C112	3300 10%		DI-3300		DPMS6D33	CCD-332	JL-233	10TS-D33
C113	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C114	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C115	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C116	.68 250V		P484CM-68		PM4P68		GEM-6068	
C117	330 10%		DI-330	DD-331	Li0T33	CCD-331	GP333	10TS-T33
C118	.027 250V		P684CM-027		DPMS6S27	6DP-3-273	GEM-413	6PS-S27
C119	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C120	24 N150 5%	#C50070-8				*		
C121	330 10%		DI-330	DD-331	Li0T33	CCD-331	GP333	10TS-T33
C122	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C123	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C124	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C125	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C126	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C127	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C128	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C129	220 10%		DI-220	DD-221	Li0T22	CCD-221	GP322	10TS-T22
C130	100 N1500	#C50070-5		TCL-100		*		
C131	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C132	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C133	33 N750 5%			DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C134	2700 10%		DI-2700		DPMS6D27	CCD-272	GEM-1623	10TS-D27
C135	3300 10%		DI-3300		DPMS6D33	CCD-332	JL-233	10TS-D33
C136	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C137	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C138	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C139	.68 250V		P684CM-68		PM4P68		GEM-6068	
C140	330 10%		DI-330	DD-331	Li0T33	CCD-331	GP333	10TS-T33
C141	.027 250V		P684CM-027		DPMS6S27	6DP-3-273	GEM-413	6PS-S27
C142	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C143	24 N150 5%	#C50070-8				*		
C144	330 10%		DI-330	DD-331	Li0T33	CCD-331	GP333	10TS-T33
C145	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C146	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C147	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C148	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C149	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C150	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10

Fisher Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Switch		R50-160-29					Loudness
B	100K *							Master Volume, Channel B
C	100K *							Master Volume, Channel A
D	Switch							Power Off-On
R2A	250K		R50-160-31					Center Volume
B	500K							Balance, Channel A
C	250K Tap 500K							Balance, Channel B
R3A	250K Tap 500K		R50-160-28					Treble, Channel B
B	250K Tap 500K							Treble, Channel A
R4A	250K Tap 1meg		R50-160-30					Bass, Channel B
B	500K Tap 1meg							Bass, Channel A
R5	500K Tap 100K	1/4	R50-160-20	JP-104			MLC15L	MPX Stereo Control
R6	250K	1/4	R50-160-3	JL-254			MLC254L	AM Level
R7	250K	1/4	R50-160-3	JL-254			MLC254L	Phono Level, Channel A
R8	250K	1/4	R50-160-3	JL-254			MLC254L	Phono Level, Channel B
R9	250K	1/4	R50-160-3	JL-254			MLC254L	Tape Record Level, Channel A
R10	250K	1/4	R50-160-3	JL-254			MLC254L	Tape Record Level, Channel B
R11	250K	1/4	R50-160-3	JL-254			MLC254L	Muting Level

* Taps @ 35K & 65K.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R12	330Ω	
R13	2700Ω	
R14	330Ω	
R15	100K	
R16	120Ω	
R17	330K	
R18	330K	
R19	470K	
R20	1000Ω	
R21	2200Ω	
R22	22Ω	
R23	2200Ω 1W	
R24	1.8meg	
R25	1.8meg	
R26	100K	
R27	47K	
R28	47K	
R29	82K	
R30	1000Ω	
R31	120Ω	
R32	56K	
R33	470Ω	
R34	120Ω	
R35	82K	
R36	1000Ω	
R37	15K	
R38	220K	
R39	1000Ω	
R40	22K 1W	
R41	100Ω	
R42	270Ω	
R43	100K	
R44	330K	
R45	1500Ω	

ITEM No.	RATING	REMARKS
R46	1000Ω	
R47	6800Ω	
R48	6800Ω	
R49	33K	
R50	220K	
R51	3.3meg	
R52	15meg	
R53	1meg	
R54	68K	
R55	470K	
R56	150K	
R57	100K	
R58	470K	
R59	470K	
R60	100K	
R61	1000Ω	
R62	220K	
R63	220K	
R64	1000Ω	
R65	4.7Ω	
R66	4.7meg	
R67	1000Ω	
R68	47K	
R69	120Ω	
R70	3.3meg	
R71	4.7Ω	
R72	820K	
R73	100Ω	
R74	22K	
R75	1000Ω	
R76	22K 1W	
R77	270Ω	
R78	270Ω	
R79	1000Ω	

ITEM No.	RATING	REMARKS
R80	68K	
R81	100Ω	
R82	270Ω	
R83	270Ω	
R84	2.2meg	
R85	820K	
R86	1000Ω	
R87	27K	
R88	47K	
R89	47K	
R90	3.3meg	
R91	470K	
R92	68K	
R93	180Ω	
R94	82K	
R95	10Ω	
R96	2700Ω 1W	
R97	10K	
R98	100K	
R99	330K 1W	
R100	4.7meg	
R101	220K	
R102	470K	
R103	1meg	(470K) *
R104	47K	
R105	470Ω	
R106	270K	
R107	3.9meg	
R108	330K	
R109	470K	
R110	220Ω	
R111	10K	
R112	10K	
R113	22K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT) (cont)

ITEM No.	RATING	REMARKS
R114	10meg	
R115	470K	
R116	1.5meg	
R117	100K	
R118	1800Ω	
R119	2.2meg	
R120	100K	
R121	1800Ω	
R122	330K	
R123	470K	
R124	1meg	
R125	47K	
R126	1500Ω	
R127	27K	
R128	470K	
R129	470K	
R130	470K	
R131	68K	
R132	82K	
R133	10Ω	
R134	2700Ω 1W	
R135	10K	
R136	100K	
R137	330K 1W	
R138	4.7meg	
R139	220K	
R140	470K	
R141	3.9meg	
R142	1meg	
R143	47K	
R144	470Ω	
R145	330K	
R146	270K	
R147	470K	
R148	220Ω	
R149	10K	
R150	22K	
R151	10K	
R152	10meg	
R153	470K	
R154	1.5meg	
R155	100K	
R156	1800Ω	
R157	2.2meg	
R158	100K	
R159	1800Ω	
R160	330K	
R161	1meg	
R162	1500Ω	
R163	47K	
R164	68K	
R165	10K	
R166	10K	
R167	1000Ω	
R168	1000Ω	
R169	1200Ω 1W	
R170	1200Ω 1W	
R171	400Ω 5W	IRC#PW5-400Ω
R172	400Ω 5W	IRC#PW5-400Ω
R173	100Ω 5W	IRC#PW5-100Ω
R174	12Ω 5W	IRC#PW5-12Ω
R175	1000Ω	
R176	18K	

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FISHER PART No.	REPLACEMENT DATA
K1	Phone Equalization		PC50187-3	
K2	Tone Comp.	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	PC657-140	Centralab PC-190 Sprague TC-1
K3	High Freq. Filter		PC50187-2	
K4	Phone Equalization		PC50187-3	
K5	Tone Comp.	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	PC657-140	Centralab PC-190 Sprague TC-1
K6	High Freq. Filter		PC50187-2	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		FISHER PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	FM Ant. Coil	L50066-8	TV-180	4608		RTC-8518	3.3uh
L2	FM Ant. Trans.	L726-124					
L3	RF Choke	L50066-2	BC-561	4602		RTC-8515	1uh
L4	RF Choke	L50066-19		4588		RTC-8513	.56uh
L5	RF Choke	L50066-19		4588		RTC-8513	.56uh
L6	RF Choke	L629-180①					
L7	FM RF Coil	L726-126					
L8	RF Choke	L50066-2	BC-561	4602		RTC-8515	1uh
L9	FM Osc. Coil	L726-125					
L10	RF Choke	L50066-2	BC-561	4602		RTC-8515	1uh
L11	RF Choke	L50066-3	BC-561	4602		RTC-8515	1.2uh
L12	Cathode Choke	L50066-19		4588		RTC-8513	.56uh
L13	Fil. Choke	L50066-3	BC-561	4602		RTC-8515	1.2uh
L14	1st FM IF Trans.	ZZ662-117	FM-256	1463-PC		RTC-8548	
L15	2nd FM IF Trans.	ZZ629-142	FM-254	1463		RTC-8549	
L16	3rd FM IF Trans.	ZZ50210-2	FM-254	1463		RTC-8549	
L17	4th FM IF Trans.	L551-121					
L18	Ratio Detector	ZZ592-170	FM-255▲	1465▲		RTC-8600	
L19	FM Muting Osc. Coil	L50210-21					
L20	AM Ant. Trans.	L721-139	BC-380	70-A		RTC-8731	
L21	Loopstick	L721-136	BC-419	705-A			
L22	AM RF Trans.	L670-151	BC-382 *	70-RF *		RTC-8732 *	
L23	AM Osc. Coil	L50210-22	BC-393	70-OSC		RTC-8646	
L24	1st AM IF Trans.	ZZ50210-3					
L25	2nd AM IF Trans.	ZZ50210-3					
L26	3rd AM IF Trans.	ZZ2984	BC-353	12-C2	RF-2	RTC-8633	
L27	10KC Filter Coil	L644-120					

① Wound on 100Ω Resistor. ▲ Connect M5 & M6 externally. * Fabricate Mounting.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	FISHER PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .88A	520 VCT @ .100A	6.3V@ 3.1A	T721-115						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 2.7A	6.3V (Not Used)	25V@ .7A							

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	FISHER PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.450A	SR721-143 *			604B		* Bridge Type Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FISHER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 250V	F-3000		312003	342001	AGC-3	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FISHER PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N295	V-1N295	1N295	1N295	Tuning Ind. Rectifier (Clip in)
M4	1N295	V-1N295	1N295	1N295	Tuning Ind. Rectifier (Clip in)
M5	1N542	V-1N542	1N295	1N295	FM Det. (Clip in) Matched
M6	1N542	V-1N542	1N295	1N295	FM Det. (Clip in) Pair

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M7	Tuning Cap.	C726-116	FM, 2 Gang
M8	Tuning Cap.	C684-127	AM, 3 Gang (Ant. 10-505mmf, RF 10-503mmf, Osc. 7-138mmf)
M9	Switch	S721-144	Function Selector (Rotary Wafer)
M10	Switch	S721-145	Mono-Stereo (Rotary Wafer)
M11	Switch	S50200-2 *	Local-Distance (DPDT, Slide Type)
M12	Switch	S50200-2 *	FM AUX - AUX (DPDT, Slide Type)
M13	Switch	S50200-2 *	AM Sharp-AM Broad (DPDT, Slide Type)
M14	Switch	S50200-2 *	Muting (DPDT, Slide Type)
M15	Switch	S50200-2 *	Lo Filter, Off-On (DPDT, Slide Type)
M16	Switch	S50200-2 *	Tape Off-On (DPDT Slide Type)
M17	Switch	S50200-2 *	Hi Filter Off-On (DPDT, Slide Type)
M18	Switch	S50200-2 *	Normal-Reverse (DPDT, Slide Type)

* Alternate Part #S50200-4.

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

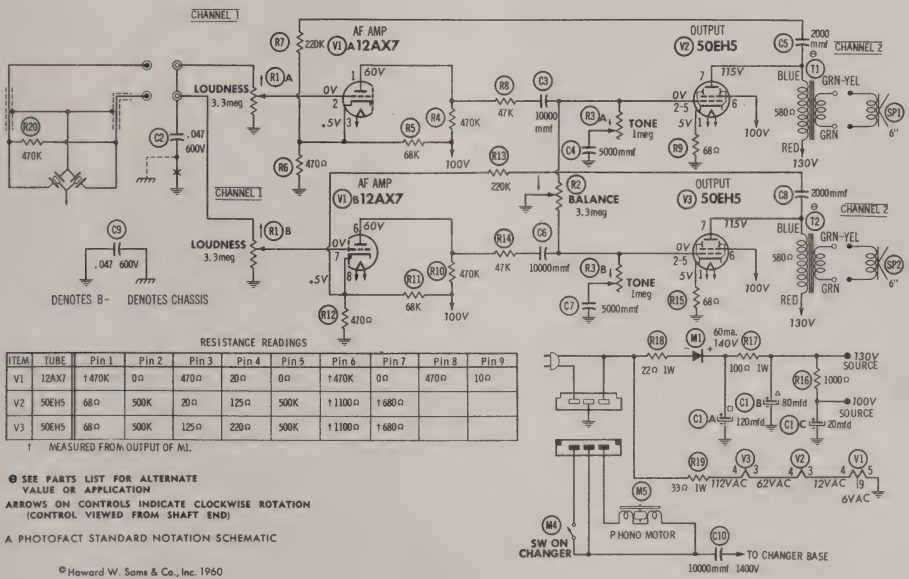
PHOTOFACT® Folder

MAGNAVOX
CHASSIS AMP80-01-00

MAGNAVOX
CHASSIS AMP80-01-00

TRADE NAME	Magnavox Chassis AMP80-01-00
MANUFACTURER	The Magnavox Co., Fort Wayne 4, Indiana
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 32 Watts, .36 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR COLLARO CONQUEST (REVISED) – PHOTOFACT SET 408 FOLDER 6 OR RECORD CHANGER MANUAL RC-11



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	0Ω	470Ω	20Ω	0Ω	†470K	0Ω	470Ω	10Ω
V2	50EH5	68Ω	500K	20Ω	125Ω	500K	†1100Ω	†680Ω		
V3	50EH5	68Ω	500K	125Ω	220Ω	500K	†1100Ω	†680Ω		

† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V2 V3	Channel 1 Output Channel 2 Output	50EH5 50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■120	150	270023-32	AFH2-19	B0180	FP216.2	TMD-2135	TVL-2439	
B	▲80	150		PRS1520	BR15015	TC495	TD-150-150	TVA-1422	
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C5	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C9	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C10	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.3meg	1/2	220151-20	B-85			FA36A	Loudness, Channel 1
B	3.3meg	1/2		SR-85			RU36A	Loudness, Channel 2
C	Shaft			Not Req.			CS3500	
R2A	1meg	1/2	220072-41	B-69	A47-1meg-S	Q11-137	U53	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	1/2	220151-15	B-70	AD47-1meg-Z		FA16A	Tone, Channel 2
B	1meg	1/2		SR-70	Not Req.		RU16A	Tone, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	470K	
R5	68K	
R6	470Ω	
R7	220K	
R8	47K	
R9	68Ω	

ITEM No.	RATING	REMARKS
R10	470K	
R11	68K	
R12	470Ω	
R13	220K	
R14	47K	
R15	68Ω	

ITEM No.	RATING	REMARKS
R16	1000Ω	
R17	100Ω 1W	
R18	22Ω 5W	IRC#PW5-22Ω
R19	33Ω 1W	
R20	470K	

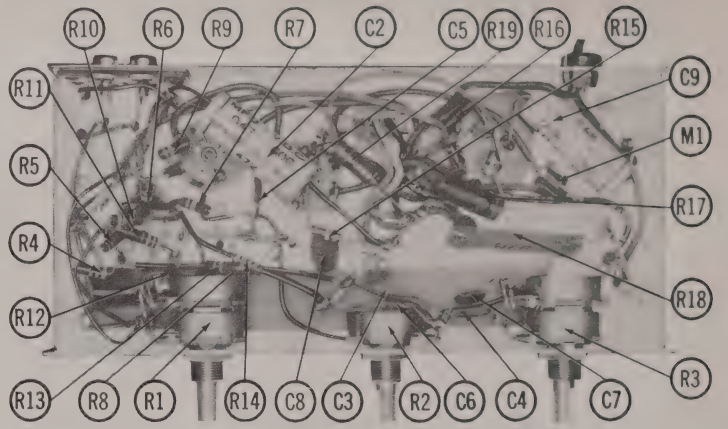
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5300Ω	3-4Ω	320084-1	A-2930	AU-601	A-3877	24S51	S-3X	① Alternate Part #320084-2
T2	5300Ω	3-4Ω	320084-1①	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	580060-1	6A15	
SP2	6"	PM	3-4Ω	580060-1	6A15	

CHASSIS—BOTTOM VIEW



RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.060A	530051-2		1N1763	2F4	SR200	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA MAGNAVOX PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		13TB		26S	Si-1 S3-3	53	J-43 & J-47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M3	(LP)	E98X † or E98XD ♦	† Jewel ♦ Diamond
	(78 RPM)	E98 † or E98D ♦	

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Switch		Off-On (Part of Changer)
M5	Motor		Phono Drive (Part of Changer)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

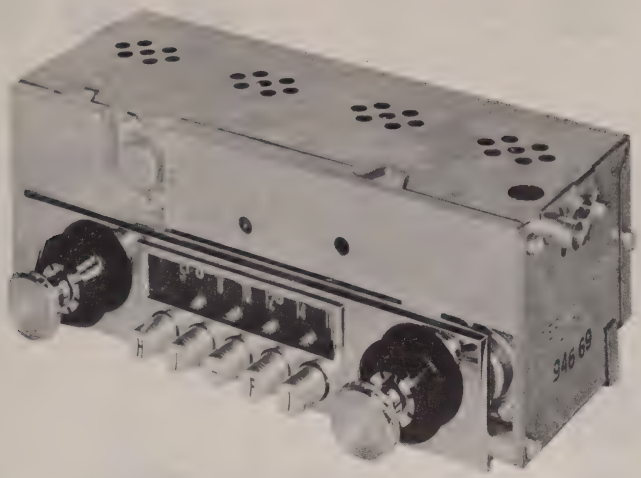
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

MOPAR
MODELS 301, 310, 313

MOPAR
MODELS 301, 310, 313



TRADE NAME	Mopar Models 301 (For PP1, PP2 1960 Plymouths), 310 (Model 301 Export Version), 313(For 1960 Valiants)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube, 3 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	540 — 1610KC RATING 1.5 Amp. @12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Suggested Alignment Tools:
A1, A2, A3, A4..GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8, A9, A10.....GENERAL CEMENT #8271, 8279, 8897, 9050-L, 9150
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) out of the coils. Repeat Step 2.					
3.	Thru dummy to antenna receptacle.	1020KC	Tuner carriage 9/16" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

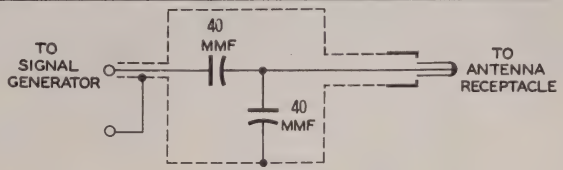


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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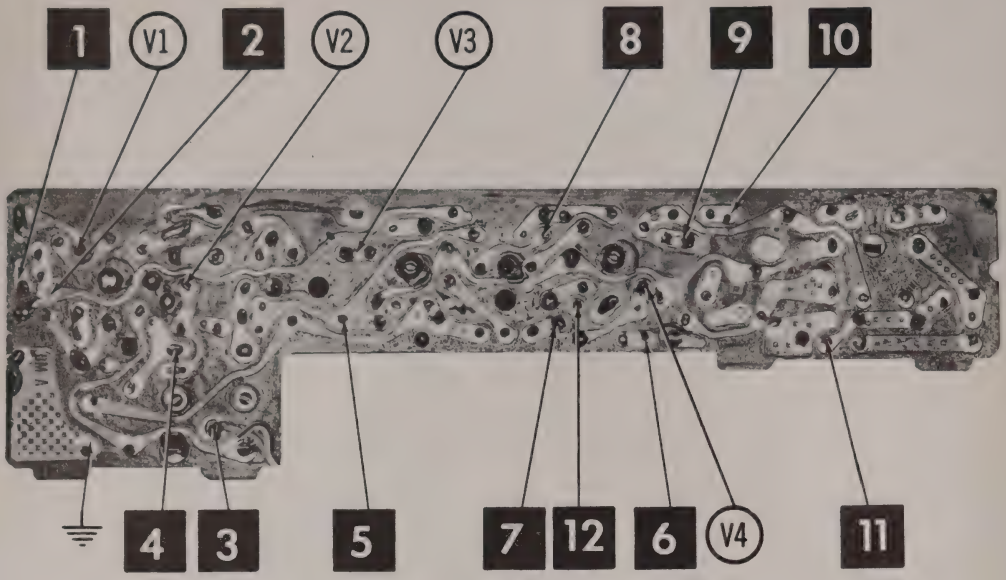
KD064

SET 507 FOLDER 11



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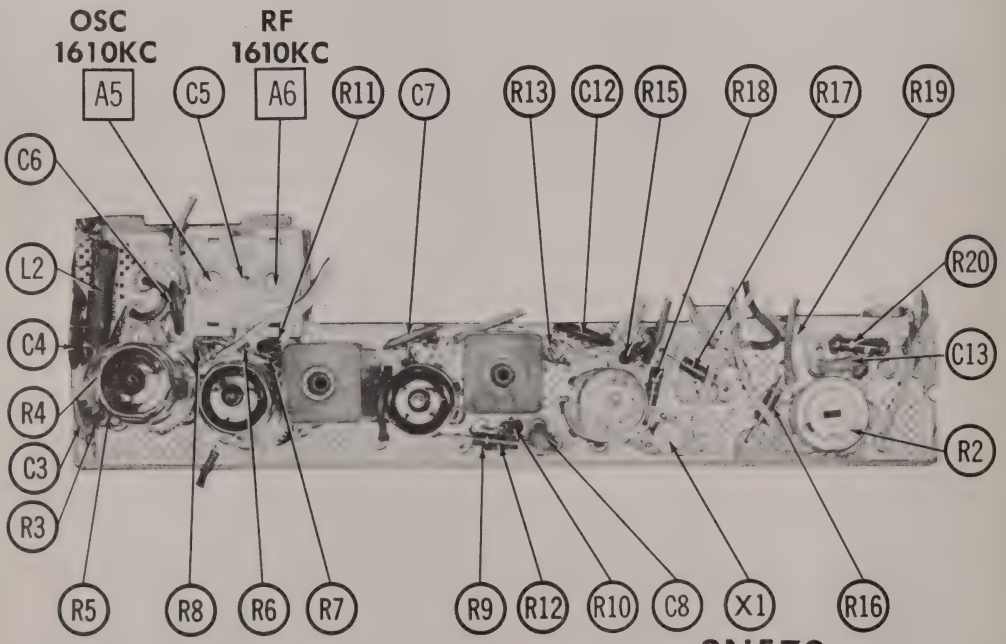
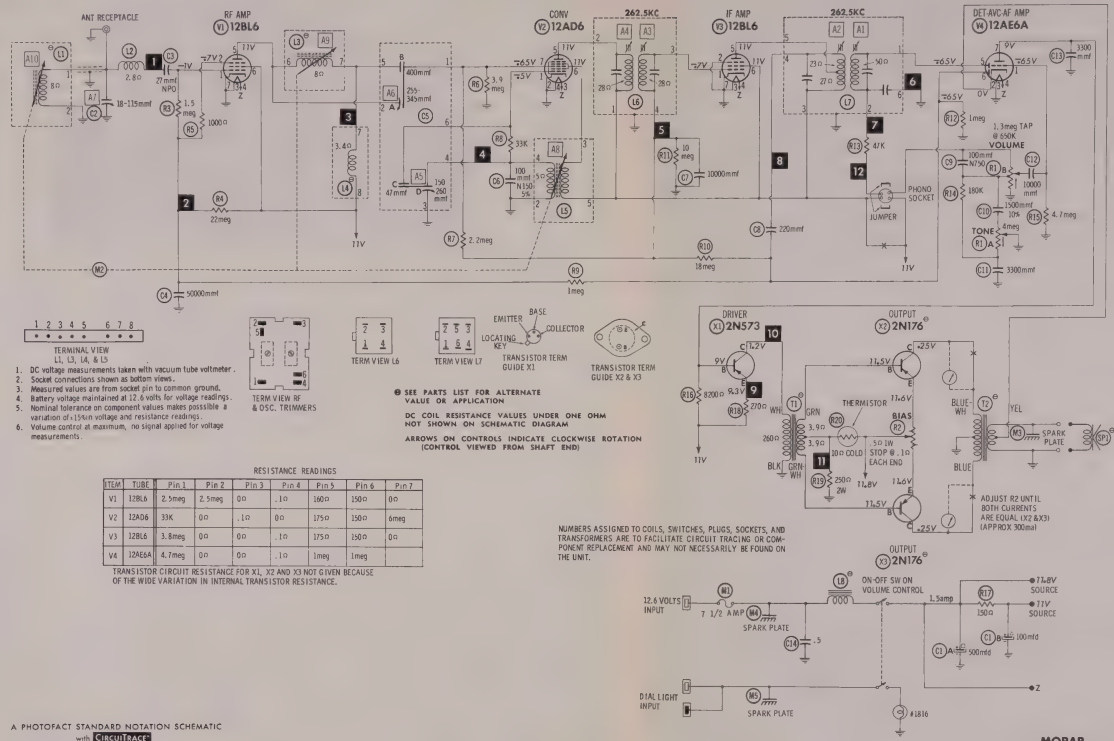
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD



TERMINAL VIEW
L1, L3, L4, & L5

TERM VIEW RF & OSC. TRIMMERS

TERM VIEW L6

TERM VIEW L7

TRANSISTOR TERM GUIDE X1

TRANSISTOR TERM GUIDE X2 & X3

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

ADJUST R2 UNTIL BOTH CURRENTS ARE EQUAL (X2 &X3) (APPROX 300ma)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	2.5meg	2.5meg	0Ω	.1Ω	160Ω	150Ω	0Ω
V2	12AD6	33K	0Ω	.1Ω	0Ω	175Ω	150Ω	6meg
V3	12BL6	3.8meg	0Ω	0Ω	.1Ω	175Ω	150Ω	0Ω
V4	12AE6A	4.7meg	0Ω	0Ω	.1Ω	1meg	1meg	

TRANSISTOR CIRCUIT RESISTANCE FOR X1, X2 AND X3 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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MOPAR
MODELS 301, 310, 313

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12AE6A

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver		2N573	2N573	PNP
X2	2N176	Output	2N301		2N176	PNP Note 1
X3	2N176	Output	2N301		2N176	PNP Note 1

Note 1. When replacing, apply DC-4 grease (Part #1IM490487) or equivalent to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	■500	16	23B539261	AFH2-02-10	B0045	WP200.5	TMD-2025	TVL-2175		
B	▲100	16								

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	18-115	#20K542026				302-M		
C3	27 NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C4	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50
C5A	255-345							
B	400	#20B563377	DI-390	DD-401	L10T4	CCD-401	GP340	10TS-T40
C	150-260							
D	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-447	CNO-447	10TCC-Q47
C6	100 N150 5%	#21R129899						10TCP-T10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCC-T10
C10	1500 10%		DI-1500	DD-152	1R5D15	CCD-152	GP315	10TS-D15
C11	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C14	.5 100V		P288N-5		CUB2P5	IDP-5-504	GEM-205	2TM-P5

Motorola Part Number.
• Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	4meg	linear	18C563338					Tone
B	1.3meg 650K Tap							Volume
C	Switch							Power Off-On
R2	.5Ω *	1W	18B562980					Bias

* Stop ⓐ. 1Ω from each end.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1.5meg	
R4	22meg	
R5	1000Ω	
R6	3.9meg	
R7	2.2meg	
R8	33K	

ITEM No.	RATING	REMARKS
R9	1meg	
R10	18meg	
R11	10meg	
R12	1meg	
R13	47K	
R14	180K	

ITEM No.	RATING	REMARKS
R15	4.7meg	
R16	8200Ω	
R17	150Ω	
R18	270Ω	
R19	250Ω 2W	Pt. #17K563839
R20	10Ω Cold	Pt. #6K540634

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Ant. Coil	24B563217 †					
L2	RF Choke	24K563490	TV-180	6176	VP-1	RTC-8593	3luh
L3	RF Coil	24B563217 †					
L4	Image Trap	24B563694 †					
L5	Osc. Coil	24B563214					
L6	Input IF Trans.	24K564120	BC-344	13-PH1		RTC-8644	
L7	Output IF Trans.	24D563300					

† Part of coil and mounting plate assembly Part #1V563237.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L8	1.8A	.2Ω	.002HY	25C563446-B ①						

① Alternate Part #25C563446.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5.8	1	25C563319-C ①					

① Alternate Part #25C563319

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6Ω	3-4Ω	25C563330-D ①						

① Alternate Part #25C563330.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9" 6"x 9"	PM PM	3-4Ω 3-4Ω	50K562405 † 50D562404 •	69A3	† Models 301, 310 • Model 313

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V	65R122346	9K563327	30707.5 (SFE 7½A 32V)	155009	SFE 7½	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77K562847	Complete (Pushbutton) (AT-292)
M3	Spark Plate	64K530177	
M4	Spark Plate	64K530177	
M5	Spark Plate	64K561877	
	Printed Board	84C563468	Include suffix letter when ordering (Less all components.) Models 301, 310

CABINETS & CABINET PARTS

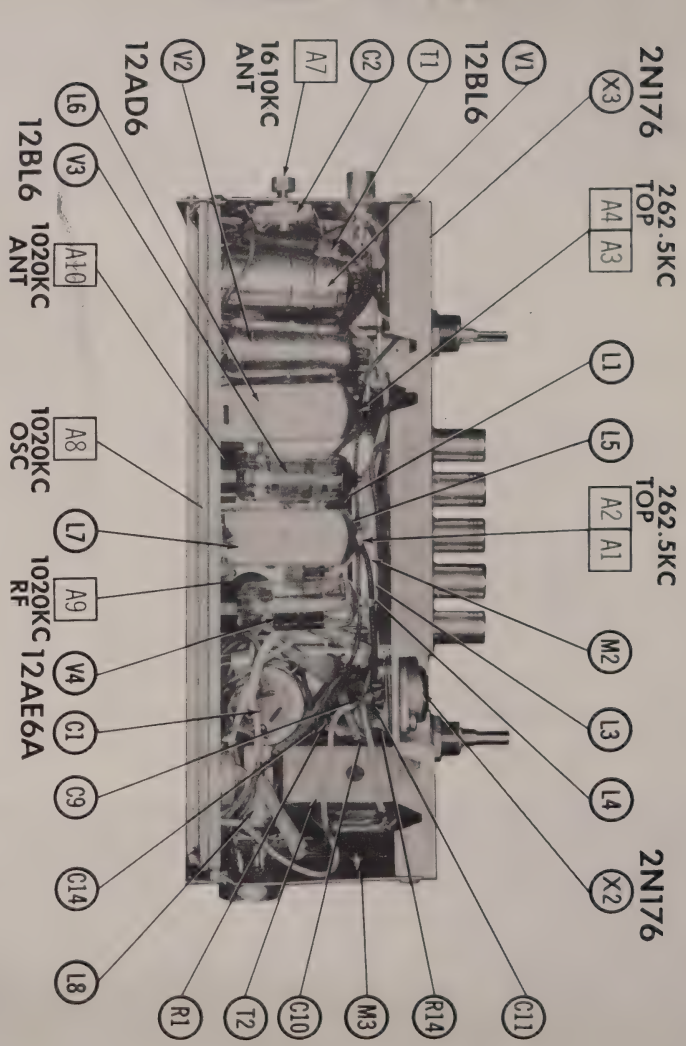
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C564099	Tuning, Volume, Model 313
Knob	36C564098	Tone, Dummy, Model 313
Knob	36B562625	Tuning, Volume, Model 301, 310
Knob	36B562639	Tone, Dummy, Models 301, 310
Dial	34B563193	Scale, Model 301
Dial	34K563390	Scale, Model 310
Dial	61A563192	Crystal
Pointer	1K563183	Includes Stud
Pushbutton	1C562641	Arm Assembly
Pushbutton	1K563315	"Plain"
Pushbutton	1K563316	"F"
Pushbutton	1A563313	"H"
Pushbutton	1K563314	"I"

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

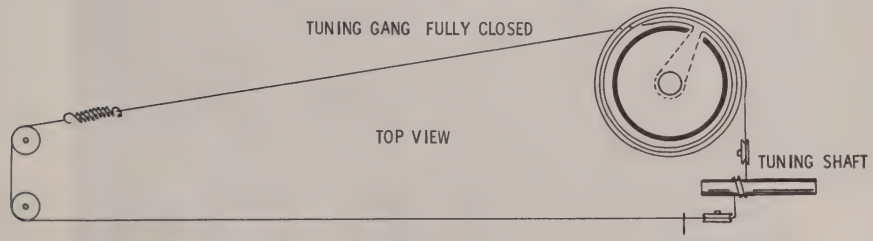
**NORELCO
MODEL L4X95T**

NORELCO
MODEL L4X95T

NORELCO
MODEL L4X95T

TRADE NAME	Norelco Model L4X95T	
MANUFACTURER	North American Philips Co., Inc., 230 Duffy Ave., Hicksville, N. Y.	
TYPE SET	Battery Operated Transistorized Portable AM Receiver	
POWER SUPPLY	9 Volts DC	RATING 11MA@9 Volts DC (No Signal, Min. Volume) 25MA@9 Volts DC (Signal, Normal Volume)
TUNING RANGES	BROADCAST 517—1622KC SHORT WAVE 1 11.6 — 22MC	SHORT WAVE 2 4.65 — 9.9MC SHORT WAVE 3 1.6 — 3.9MC

DIAL CORD STRINGING



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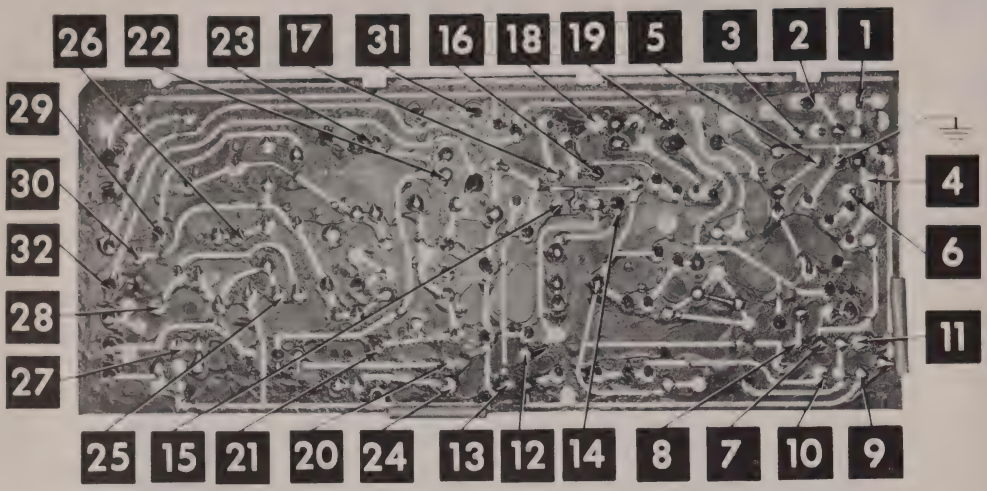
KF178

SET 507 FOLDER 12



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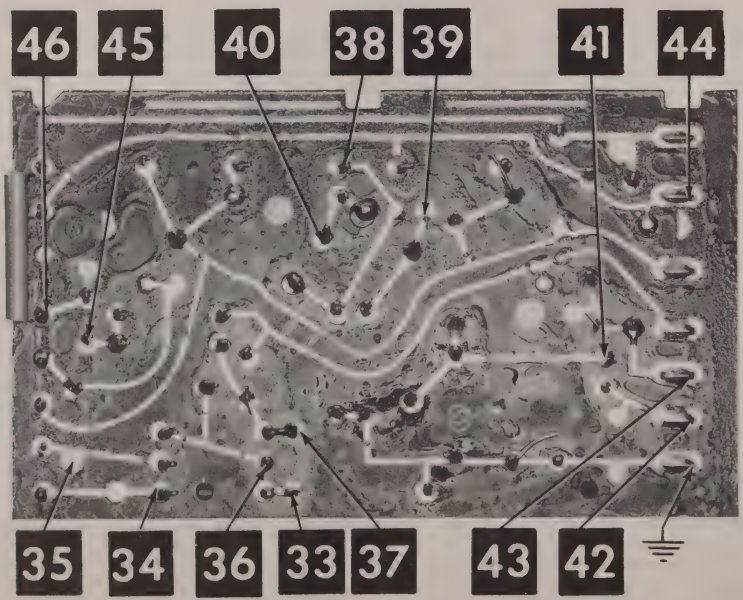

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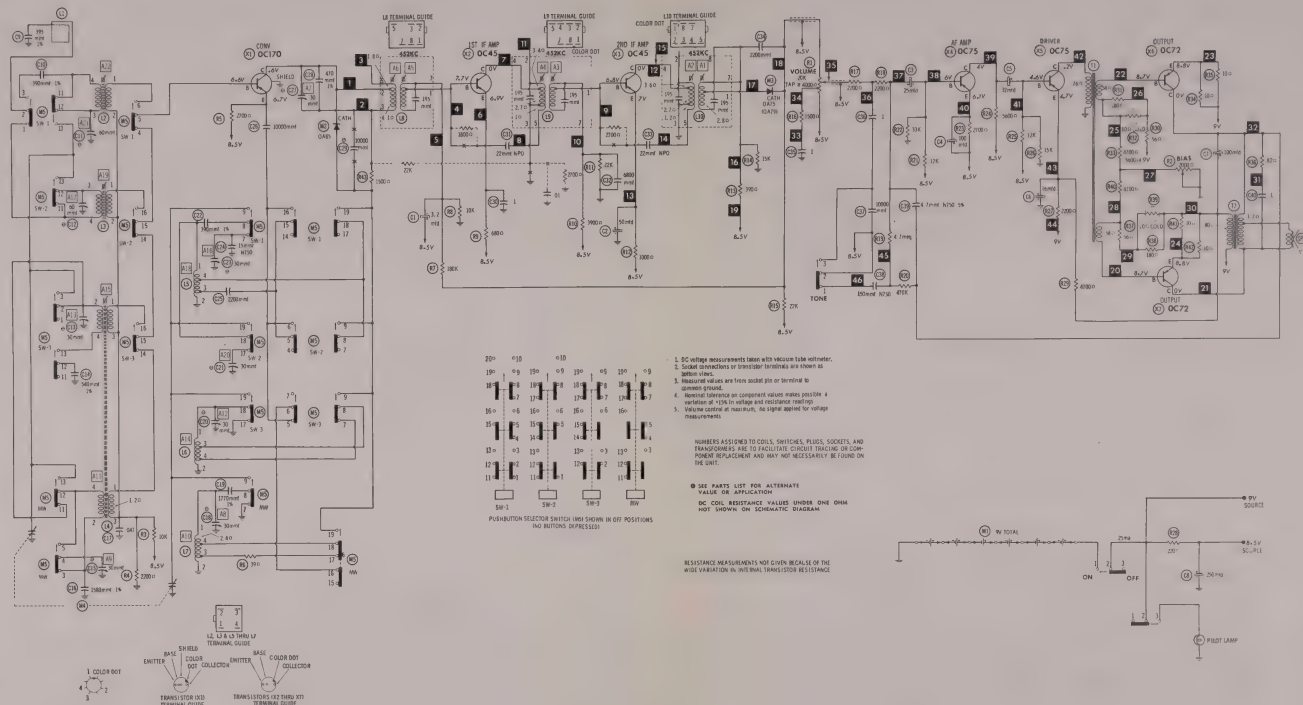

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

PUSHBUTTON SELECTOR SWITCH (NO SHOWN IN OFF POSITIONS (NO BUTTONS DEPRESSED)

SW-1 SW-2 SW-3 SW

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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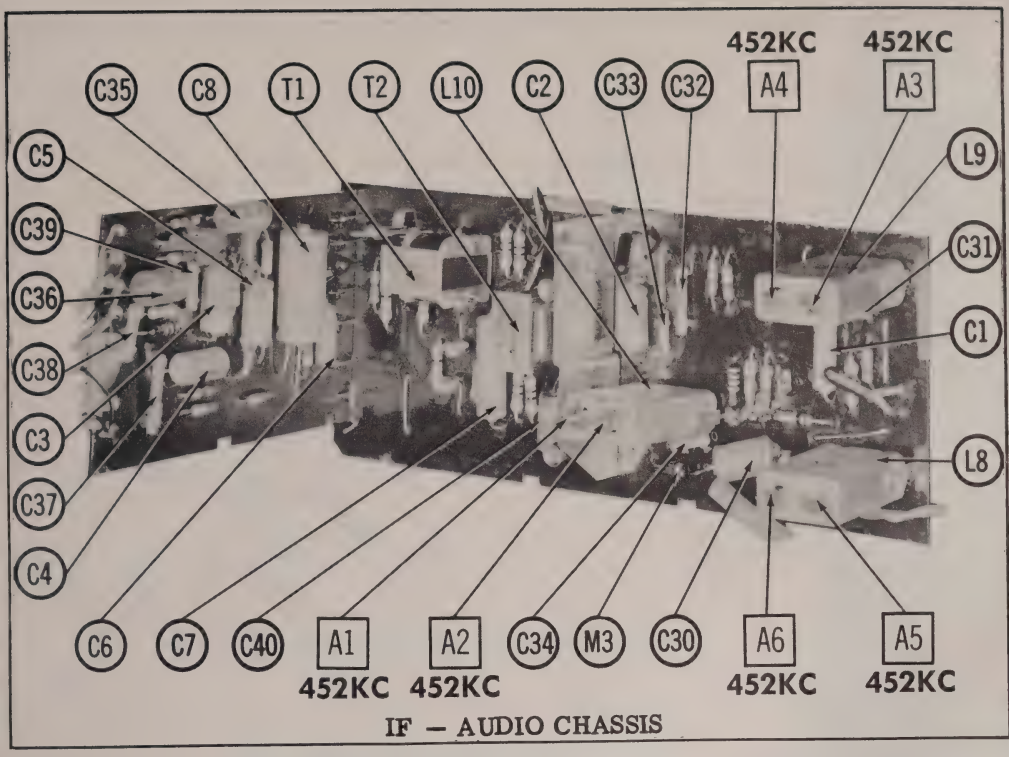
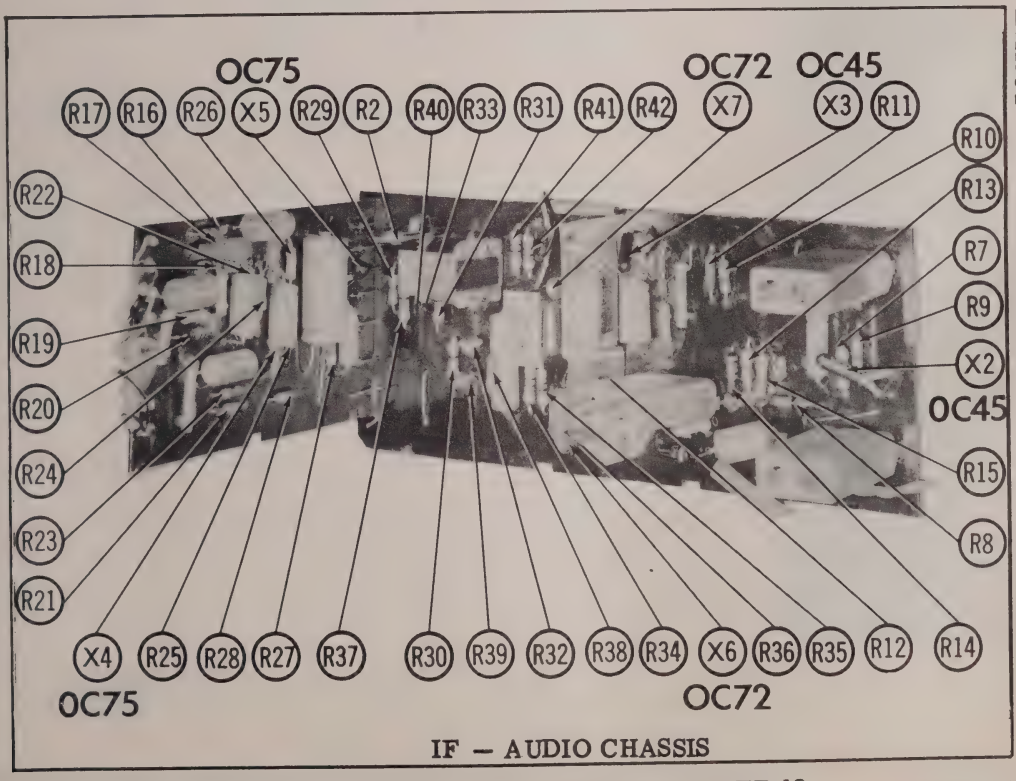
NORELCO MODEL L4X95T



IF — AUDIO CHASSIS



IF — AUDIO CHASSIS

ALIGNMENT INSTRUCTIONS

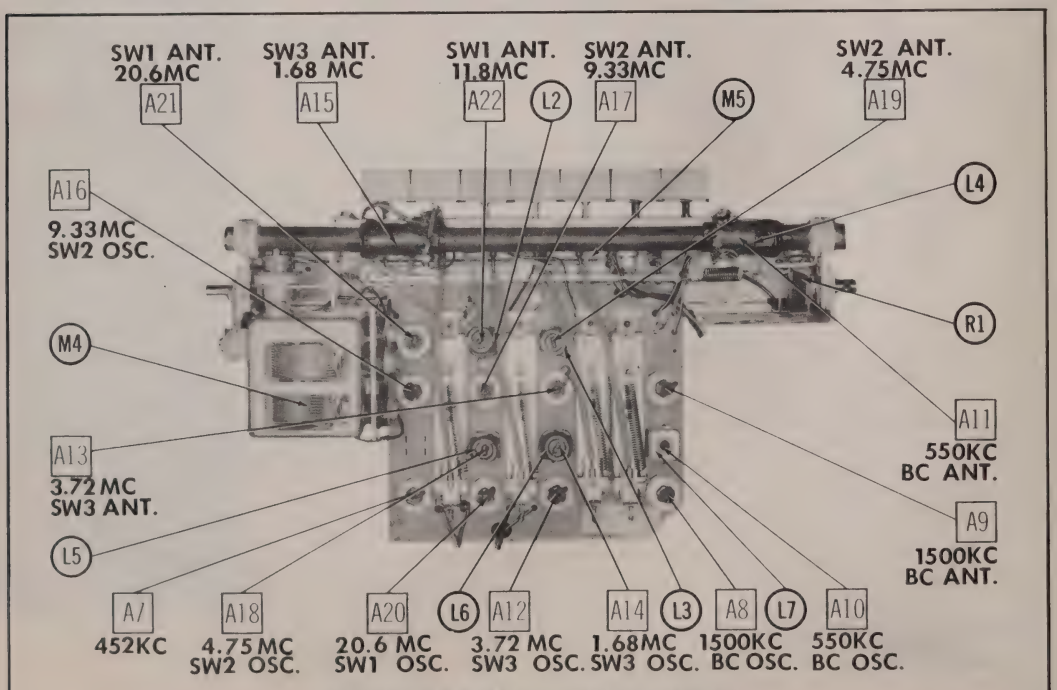
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A6.....GENERAL CEMENT #8721, 8722
WALSCO #2519

A10, A11, A14, A15, A18, A19
A22..GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	452KC (400∿ Mod.)	(MW) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4, A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	"	"	"	A7	Adjust for MINIMUM output.
3.	"	1500KC	(MW) 1500KC	"	A8, A9	Adjust for maximum output.
4.	"	550KC	(MW) 550KC	"	A10, A11	"
5.	"	3.72MC	(SW 3) 3.72MC	"	A12, A13	"
6.	"	1.68MC	(SW 3) 1.68MC	"	A14, A15	"
7.	"	9.33MC	(SW 2) 9.33MC	"	A16, A17	"
8.	"	4.75MC	(SW 2) 4.75MC	"	A18, A19	"
9.	"	20.6MC	(SW 1) 20.6MC	"	A20, A21	"
10.	"	11.8MC	(SW 1) 11.8MC	"	A22	Adjust for maximum output. Repeat Steps 3 thru 10.



RF CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC170	Converter				PNP
X2	OC45	1st IF Amplifier		2N483	2N410	PNP
X3	OC45	2nd IF Amplifier		2N483	2N410	PNP
X4	OC75	AF Amplifier	2N406	2N362		PNP
X5	OC75	Driver	2N408	2N362		PNP
X6	OC72	Output	2N408	2N632	2N408	PNP
X7	OC72	Output	2N408	2N632	2N408	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	NORELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	3.2	70		PRS1400	NLW3-100	TT80X4	TD-4-150	TE-1402	
C2	50	12.5		XPP-15050	BBR50-25	TT15X50	ML50-15	TE-1160	
C3	25	25	AC5705/25	PRS1265	BBR25-25	TT25X25	ML30-15	TE-1207	
C4	100	3	AC5710/100	XPP-3100	NLW100-6	TT6X100	ML100-3	TE-1059.5	
C5	32	18	AC5714/32	PWE25030	BBR25-25	TT50X35	ML30-25	TE-1208	
C6	16	16	AC5703/16	XPP-25015	NLW15-25	TT25X15	ML15-25	TE-1205	
C7	100	12.5		SRE15V100	BBR100-25	TT15X100	ML100-15	TE-1162	
C8	250	12.5		BCD20200	BR2502		TD-250-15	TE-1164	

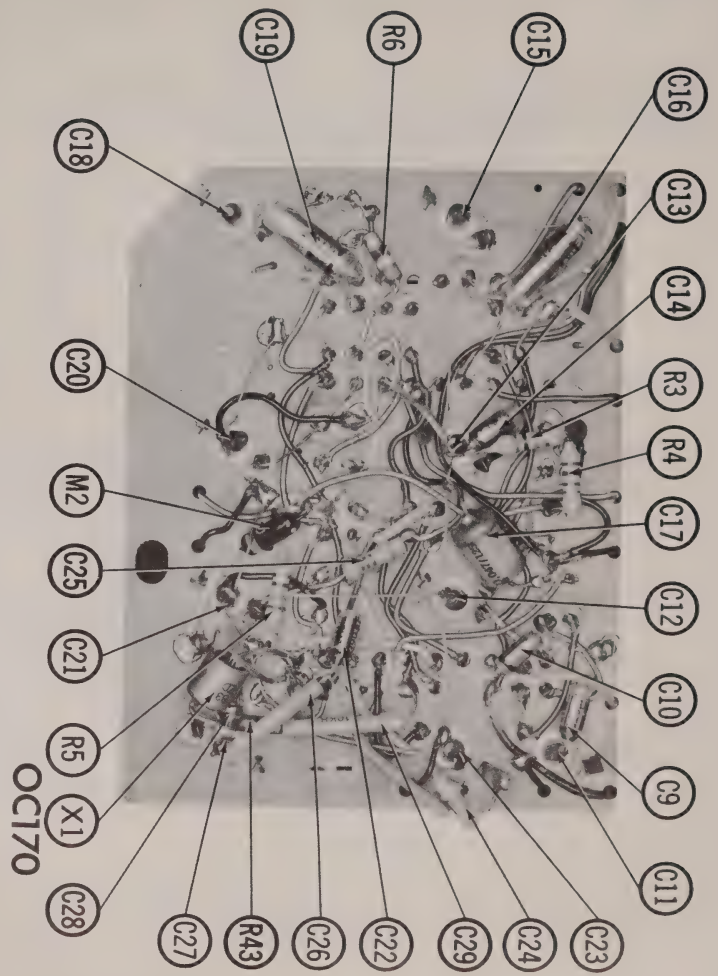
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	395 1%	#B151455						
C10	390 1%	#B151444			5R5T39	VCM-20-391F		
C11	60	Note 1						
C12	60	Note 1						
C13	30	Note 1						
C14	540 1%	#B151456						
C15	30	Note 1						
C16	1580 1%	#B151457						
C17	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C18	30	Note 1						
C19	1770 1%	#B151458						
C20	30	Note 1						
C21	30	Note 1						
C22	390 1%	#B151444			5R5T39	VCM-20-391F		
C23	30	Note 1						
C24	15 N750		N750-SI 15	TCN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C25	2200		SI 2200	D6-222	BYA10D22	CCD-222	B-222	5HK-D22
C26	10000		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C27	30	Note 1						
C28	470 1%	#B151423			5R5T47	VCM-20-471F	MCE244	
C29	10000	Note 2	SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C30	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C31	22 NPO		NPO-SI 22	DTZ-22	C10Q22C	CCTO-221	CNO-422	10TCC-Q22
C32	6800		SI 6800	D6-682	BYA10D68	CCD-682	B-268	5HK-D68
C33	22 NPO		NPO-SI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C34	2200		SI 2200	D6-222	BYA10D22	CCD-222	B-222	5HK-D22
C35	.1 125V		P288N-1	DF-104	CUB2P1	2DP-4-104	GEM-201	2TM-P10
C36	.1 125V		P288N-1	DF-104	CUB2P1	2DP-4-104	GEM-201	2TM-P10
C37	10000		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C38	150 N750		N750-SI 150	TCN-150	C10T15U	CCTN-151	CN7-315	10TCU-T15
C39	4.7 N750 5%		N750-SI 4.7	TCN-5	C10V47U	CCTN-4R7	CN7-547	10TCU-V47
C40	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

Note 1. Nominal Value.
Note 2. Not used in some versions.
Noreico Part Number.

RF CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NORELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	20K 4000Ω Tap	½	E098AG/ 00B25					Volume
R2	2000Ω	½	B115454					Bias

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	10K	
R4	2200Ω	
R5	2700Ω	
R6	39Ω	
R7	180K	
R8	10K	
R9	680Ω	
R10	3900Ω	
R11	22K	
R12	1000Ω	
R13	390Ω	
R14	15K	
R15	22K	
R16	1500Ω	

ITEM No.	RATING	REMARKS
R17	2200Ω	
R18	2200Ω	
R19	4.7meg	
R20	470K	
R21	12K	
R22	33K	
R23	2700Ω	
R24	5600Ω	
R25	12K	
R26	15K	
R27	2200Ω	
R28	220Ω	
R29	4700Ω	
R30	56Ω	

ITEM No.	RATING	REMARKS
R31	180Ω	
R32	10Ω Cold	Pt. #B83200IA/ 130E
R33	4700Ω	(5600Ω) *
R34	10Ω	
R35	10Ω	
R36	82Ω	
R37	56Ω	
R38	180Ω	
R39	10Ω Cold	Pt. #B83201A/ 130E
R40	4700Ω	
R41	10Ω	
R42	10Ω	
R43	1500Ω	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		NORELCO PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Sw. 1 & Sw. 2 Loop Ant.						
L2	Sw. 1 Ant. Trans.	A380489					
L3	Sw. 2 Ant. Trans.	A380490					
L4A	Sw. 3 Loopstick	A380486					
B	BC Loopstick						
L5	Sw. 1 & Sw. 2 Osc. Coil	A380491					
L6	Sw. 3 Osc. Coil	A380492					
L7	BC Osc. Coil	A312932					
L8	1st IF Trans.	A312935					
L9	2nd IF Trans.	A312934					
L10	3rd IF Trans.	A312933					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.6	1	A316211					
		SEC. 2						
		1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	NORELCO PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω	120Ω Tap @ 65Ω	A315411						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	NORELCO PART No.	QUAM PART No.	
SP1	5"	PM	65.0Ω	AD3500KWZ		

BATTERIES

ITEM No.	VOLTAGE	NORELCO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			230 *		A100 *		M-13R *	* 6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		NORELCO PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	OA85				Overload & AVC (Pigtail)
M3	OA75 *				Detector (Pigtail)

* Alternate Type OA79.

MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M4	Tuning Cap.		2 Gang (Ant. 8-533mmf, Osc. 7-181mmf)
M5	Switch Assembly		Function & Tone (Pushbutton Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial	A395574	"S"
Dial	A395576	"O.S."
Dial	A395589	"CAN"
Knob	P407740/417	Tuning, Volume
Pushbutton	A366658	Battery Switch
Pushbutton	P542022/139	Dial Light, Tone, MW-OM, SW-OC3, SW-OC2, SW-OC1
Cabinet	A300728	Brown Leatherette
Front	A375634	Cabinet, Cream, Plastic
Handle	A335876	Cabinet
Knob	A351053	Handle

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder

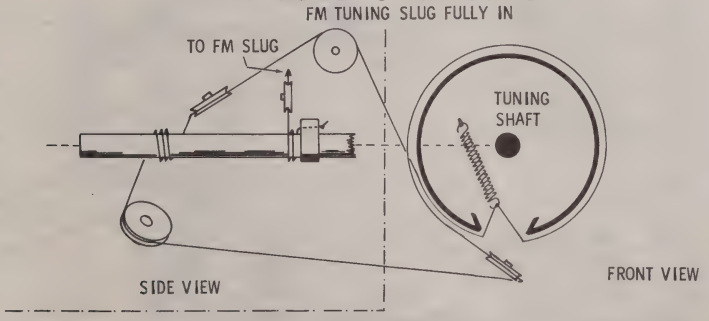
PHILCO
MODELS H984AQ, H984E

PHILCO
MODELS H984AQ, H984E

PHILCO
MODELS H984AQ, H984E

TRADE NAME	Philco Models H984AQ, H984E		
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.		
TYPE SET	AC-DC Operated 8 Tube FM-AM Receiver		
POWER SUPPLY	105-125 Volts AC-DC	RATING	35 Watts, .38 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 — 1620KC	FREQ: MOD.	88 — 108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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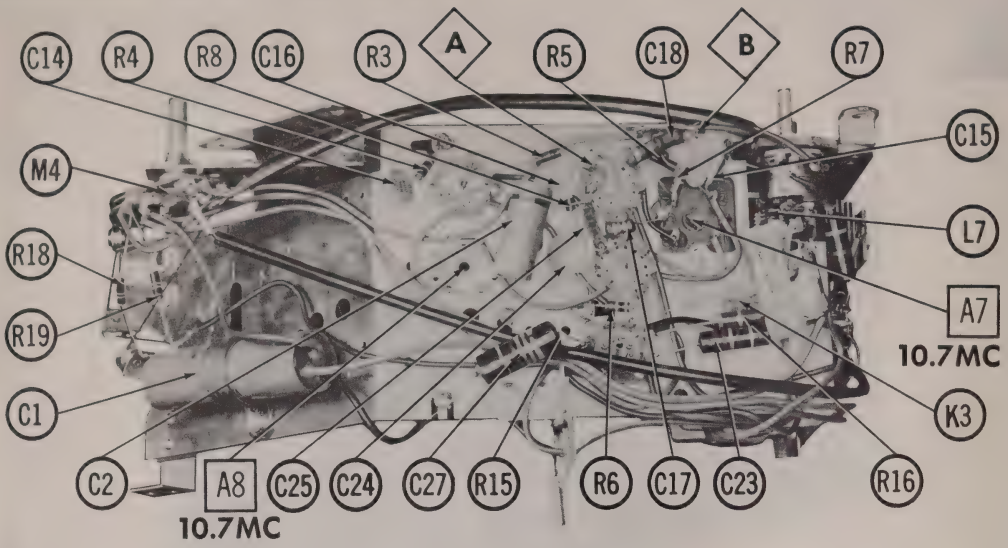
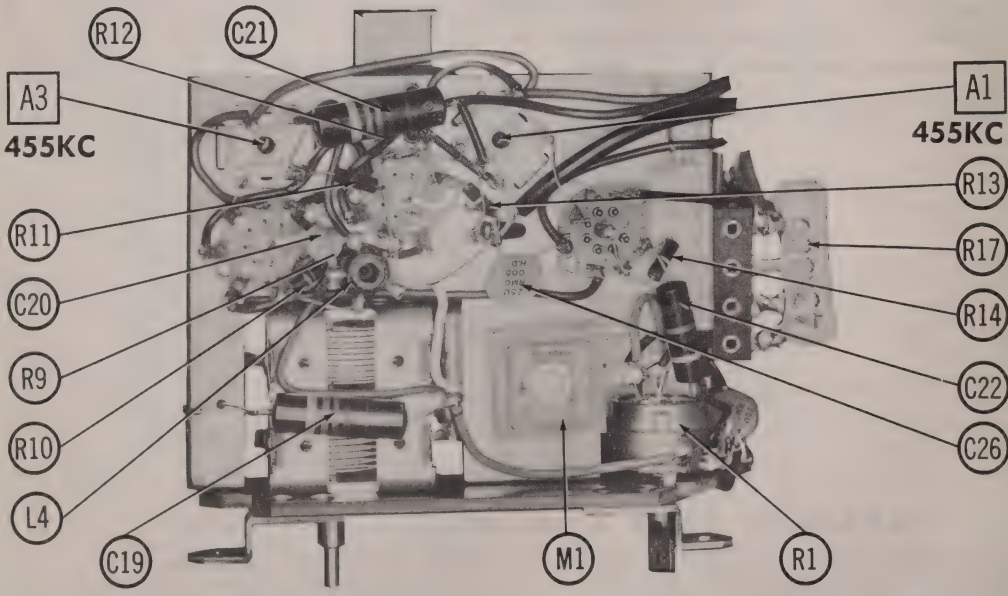


CHASSIS BOTTOM VIEW



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4, A8, A9.. GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A7, A12..... GENERAL CEMENT #9091, 9091-L
WALSCO #2542

A10, A11..... GENERAL CEMENT #9440

A13, A14..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (± 1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Across FM antenna terminals with 150Ω in each lead.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (A). Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (B). Common to point (C).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Across FM antenna terminals with 150Ω in each lead.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A7, A8, A9, A10, A11	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
5.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A12	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 150Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe to point (A). Common to chassis.	A13	Adjust for maximum deflection.
7.	"	98MC	98MC	"	A14	"

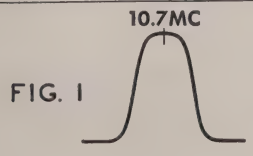


FIG. 1

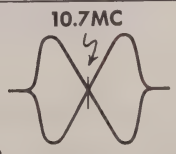
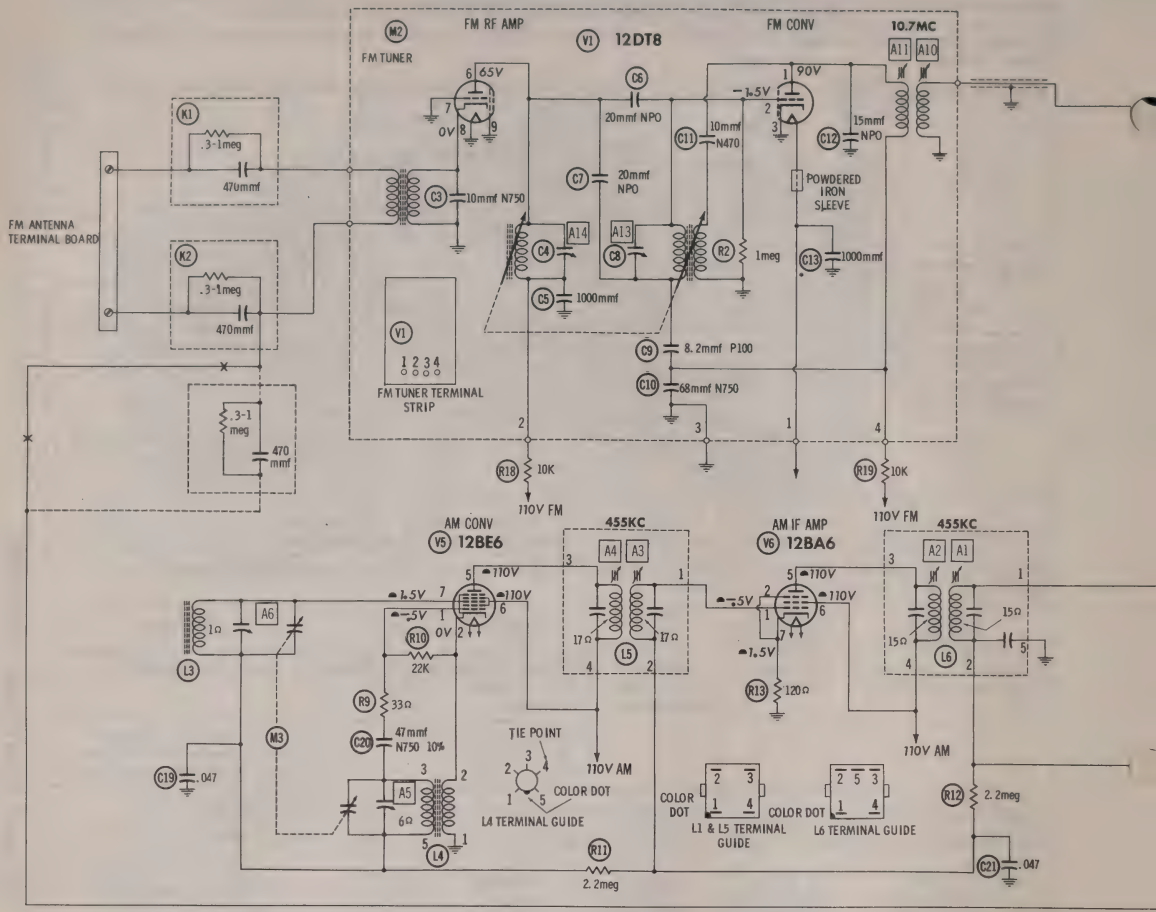


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†11K	1meg	0Ω	12Ω	0Ω	†11K	0Ω	.1Ω	0Ω
V2	12AU6	.9Ω	0Ω	72Ω	84Ω	†2200Ω	†2200Ω	68Ω		
V3	12AU6	.6Ω	0Ω	72Ω	60Ω	†2200Ω	†2200Ω	68Ω		
V4	12AL5	520K	520K	48Ω	60Ω	0Ω	0Ω	22K		
V5	12BE6	22K	.6Ω	24Ω	36Ω	▬†1200Ω	▬†1200Ω	▬4.9meg		
V6	12BA6	▬2.7meg	120Ω	36Ω	48Ω	▬†1200Ω	▬†1200Ω	120Ω		
V7	12AV6	10meg	0Ω	24Ω	12Ω	500K	0Ω	†500K		
V8	35C5	180Ω	500K	120Ω	84Ω	500K	†1200Ω	†210Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▬ MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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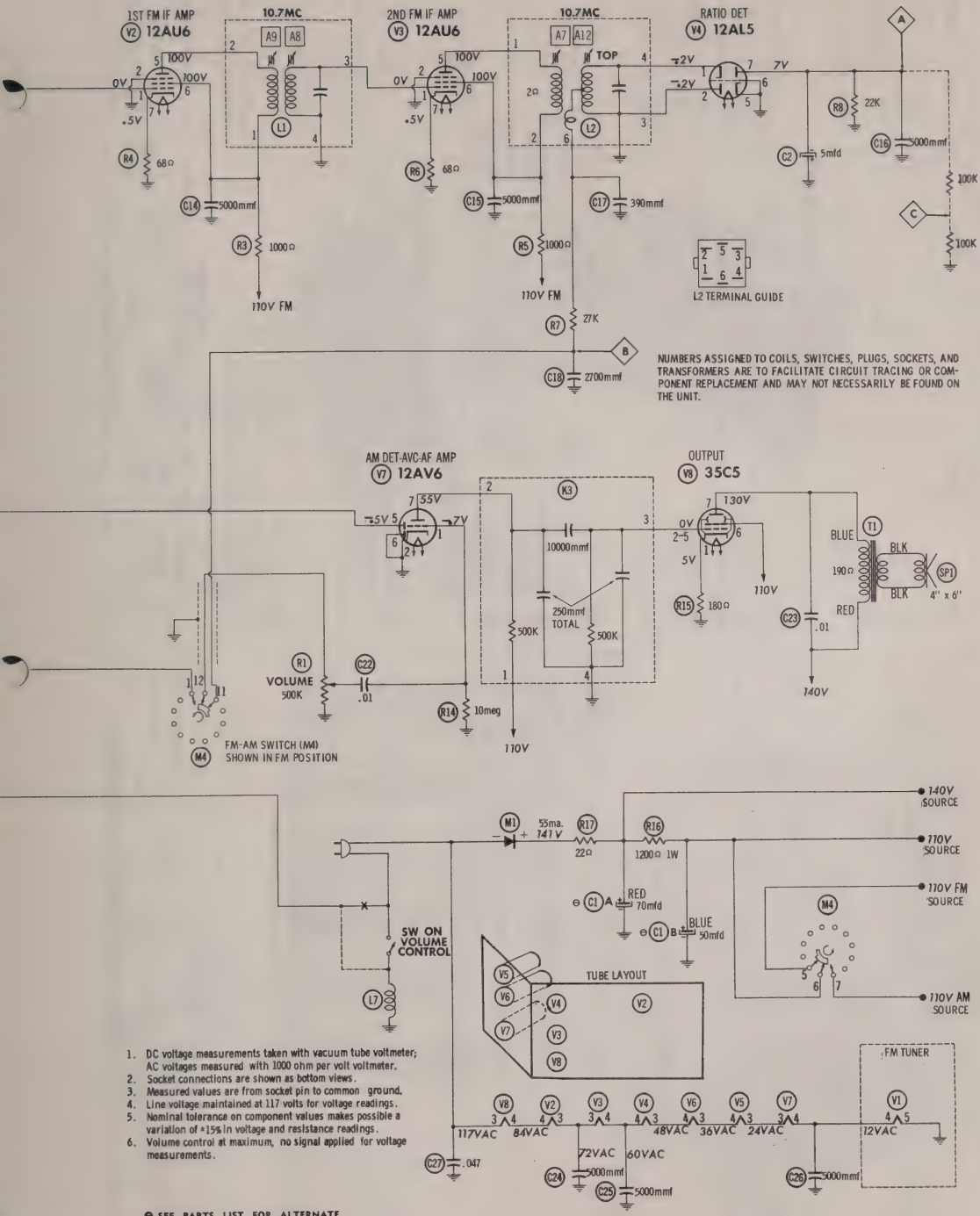


PHILCO
MODELS H984AQ, H984E

PHILCO
MODELS H984AQ, H984E

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	FM RF Amp. -FM Conv.	12DT8
V2	1st FM IF Amplifier	12AU6
V3	2nd FM IF Amplifier	12AU6
V4	Ratio Detector	12AL5
V5	AM Converter	12BE6
V6	AM IF Amplifier	12BA6
V7	AM Det. -AVC-AF Amp.	12AV6
V8	Output	35C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	70	150		PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	①
B	50	150							
C2	5	50	320-1106	PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	

① Some versions may use 50-30mfd in this application (Part #320-2106).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10 N750		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C4								
C5	1000		SI 1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-420	10TCC-Q20
C7	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-420	10TCC-Q20
C8						*		
C9	8.2 P100							
C10	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C11	10 N470					*		
C12	15 NPO		NPO-SI 15	TCN-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C13	1000		SI 1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C17	390		SI 390	D6-391	L10T39	CCD-391	B-339	10TS-T39
C18	2700		SI 2700	D6-272	L10D27	CCD-272	B-227	10TS-D27
C19	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C20	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C21	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C22	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C23	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	.047 400V		P488N-047	DD-502	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	412-5033-39	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	1000Ω	
R4	68Ω	
R5	1000Ω	
R6	68Ω	
R7	27K	

ITEM No.	RATING	REMARKS
R8	22K	
R9	33Ω	
R10	22K	
R11	2.2meg	
R12	2.2meg	
R13	120Ω	

ITEM No.	RATING	REMARKS
R14	10meg	
R15	180Ω	
R16	1200Ω 1W	
R17	22Ω	Pt. #412-5033-40 IRC#FR-22Ω
R18	10K	
R19	10K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA	
K1	FM Antenna Filter	470mmf, .3-1meg		Centralab	RC-471
				Sprague	AC1-1
K2	FM Antenna Filter	470mmf, .3-1meg		Centralab	RC-471
				Sprague	AC1-1
K3	Audio Coupling	250mmf, 10000mmf, 500K, 500K	412-5033-21	Aerovox	PA-112-3
				Centralab	PC-80
				Cornell-Dubilier	113TM1
				Mallory	MS-108
				Sprague	T-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	NOTES
L1	2nd FM IF Trans.	412-5033-30	FM-254	1463		RTC-8599	
L2	Ratio Det.	412-5033-31	FM-252	1453		RTC-9040	
L3	Loopstick	412-5033-33	BC-419	705-A			
L4	AM Osc. Coil	412-5033-29	BC-393	69-OSC		RTC-8646	
L5	1st AM IF Trans.	412-5033-34	BC-352	12-C1	RF-1	RTC-8632	
L6	2nd AM IF Trans.	412-5033-35	BC-354	12-C6	RF-2 *	RTC-8634	
L7	Line Choke		BC-561	4602		RTC-8515	1.2uh

* Connect 125mmf cap external.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHILCO PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3300Ω	3-4Ω	412-5033-32	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	QUAM PART No.	NOTES
SP1	4"x 6"	PM	3-4Ω	412-5033-19	46A07	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA PHILCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.055A	34-8003 *		1N1763 ♦	75A *	SR200 ♦	* Silicon Type ♦ Selenium Type

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	FM Tuner	412-5033-20	Complete
M3	Tuning Cap.	412-5033-38	AM, 2 Gang (Ant. 27-275mmf, Osc. 19-138mmf)
M4	Switch	412-5033-27	FM-AM (Rotary Type)

CABINETS & CABINET PARTS

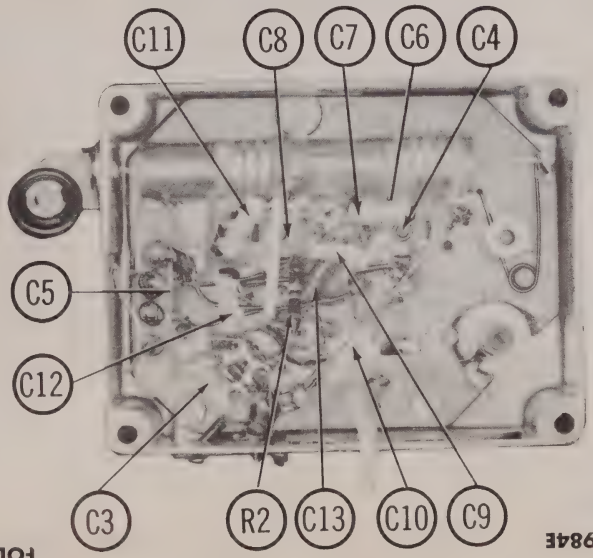
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	412-5033-13	Tuning
Knob	412-5033-7	Pointer FM
Knob	412-5033-5	Pointer AM
Knob	412-5033-6	Volume, On-Off, AM-FM
Cabinet	412-5033-2	Ebony
Cabinet	412-5033-3	Aqua

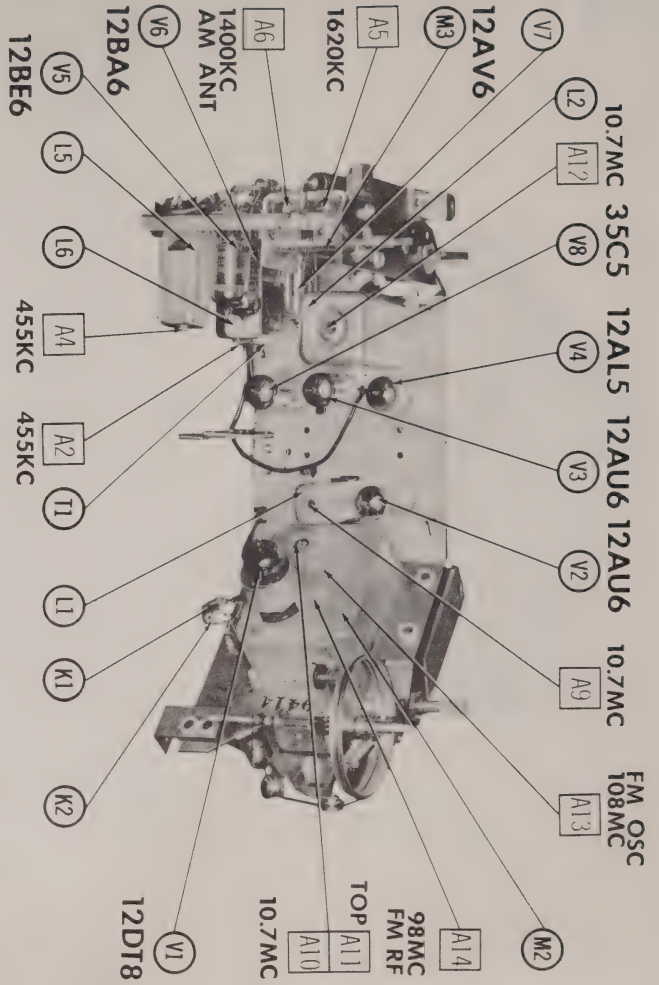
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

FM RF SUBCHASSIS



CHASSIS—TOP VIEW



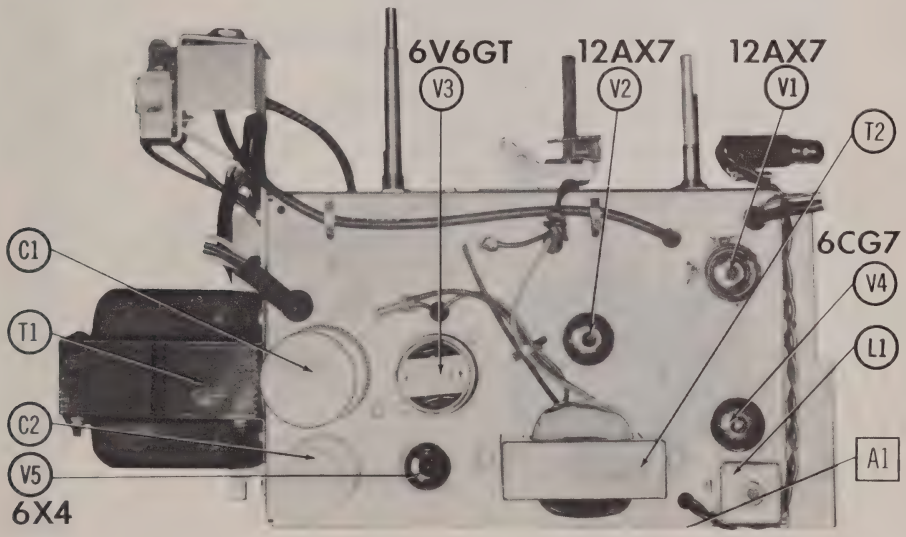
PHOTOFACT® Folder

RCA VICTOR
MODEL CP-1 (Ch. RS-174)

RCA VICTOR
MODEL CP-1 (Ch. RS-174)

TRADE NAME	RCA Victor Model CP-1 (Ch. RS-174)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 5 Tube Tape Recorder
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 50 Watts, .48 Amp. @ 117 Volts AC (Amplifier Only)
FOR SERVICE INFORMATION ON TRANSPORT MECHANISM - SEE RCA TCT-2 - PHOTOFACT SET 469 FOLDER 15	

RCA VICTOR
MODEL CP-1 (Ch. RS-174)



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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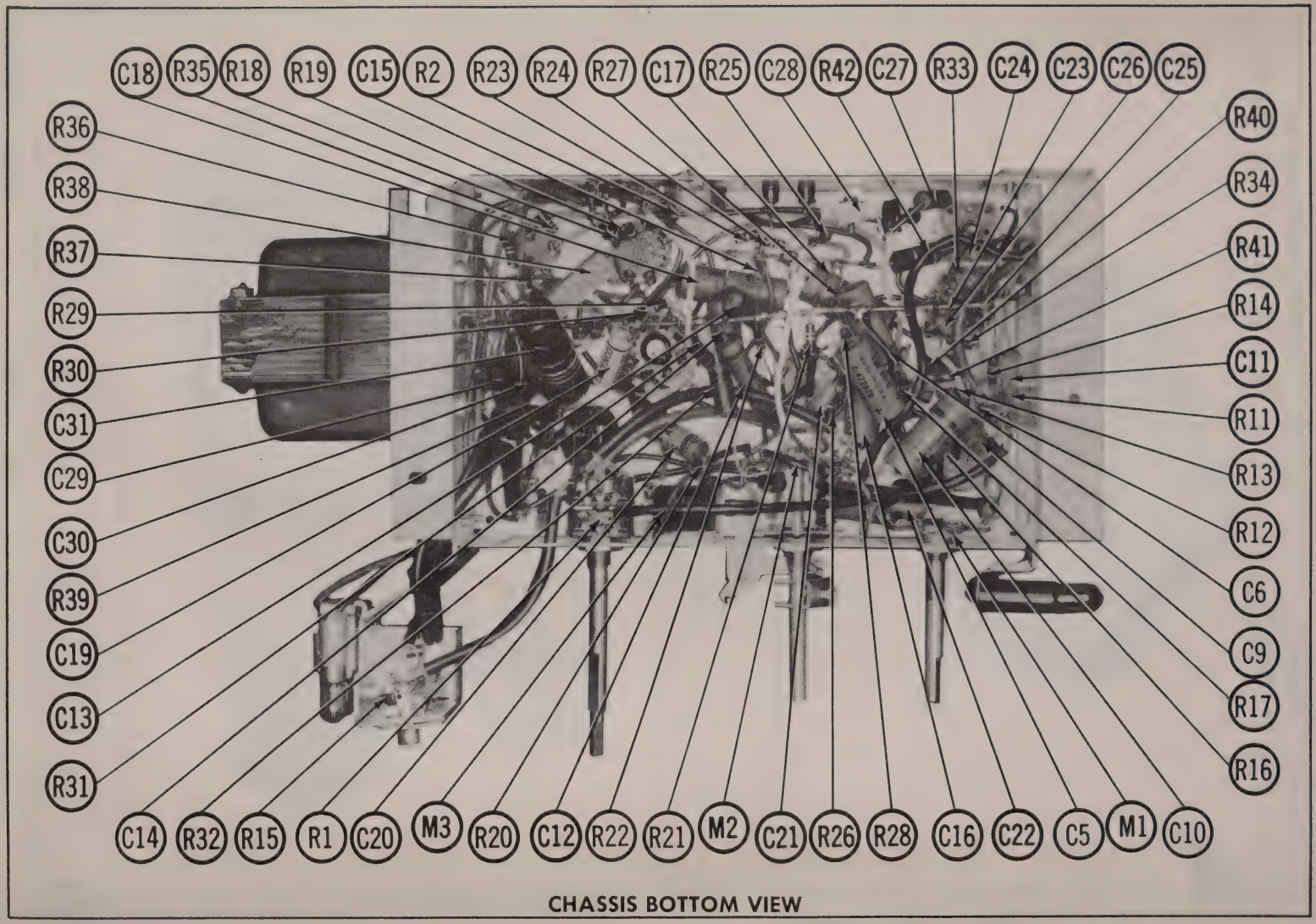


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamplifier	12AX7	V4	Bias Oscillator	6CG7
V2	AF Amplifier	12AX7	V5	Rectifier	6X4
V3	Output	6V6GT			

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1010	Tape Preamplifier				NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	400	108704	AFH3-133	C0885	FP367.5	TMT-3625	TVL-3744	
B	■30	400							
C	▲25	25							
C2A	■30	300	108705		B0310	FP227.3	TMT-3432	TVL-2628	
B	▲30	300			BR2025	TC55		TVA-1508	
C	20	200							
C3	100	25	108020	SRE25V100	BBR100-25	TC2501	ML100-25	TE-1211	
C4	100	10	108019	SRE12V100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C5	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C6	50	6	78573	SRE6V50	BBR50-6	TT6X50	TD-50-6	TVA-1100	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.022	200V	10%		V84C2S22-10%		PM4S22	4DP-2-223	GEM-1622	2TM-S22
C8	.047	200V	10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C9	.0027	400V	10%		V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6TM-D27
C10	.1	400V	10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P1
C11	.015	200V	10%		V84C2S15-10%		PM4S15	4DP-1-153		4TM-S15
C12	.022	200V	10%		V84C2S22-10%		PM4S22	4DP-2-223	GEM-16122	2TM-S22
C13	.01	200V	10%		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C14	.022	400V	10%		V84C4S22-10%		PM4S22	4DP-2-223	GEM-16122	4TM-S22
C15	220		10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C16	.047	400V	10%		V84C4S47-10%		PM4S47	4DP-3-473	GEM-1615	4TM-S47
C17	.1	400V	10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P1
C18	.1	200V	10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P1
C19	.0022	1000V	10%				DPMS16D22	16DP-2-222	GEM-1622	10TM-D22
C20	.01	600V	10%		V84C6S1-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S1
C21	330		10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C22	.1	400V	10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P1
C23	1000		10%			D6-102	5R5D1	CCD-102	GP210	10TS-D10
C24	330		10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C25	330		10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C26	390		10%			D6-391	L10T39	CCD-391	GP339	10TS-T39
C27	.0015	400V	10%		V84C4D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C28	10-160			Pt. #105574				463		
C29	.01	600V			P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C30	.01	600V			P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C31	.18	600V	10%		V84C6P2-10%			6DP-5-204	GEM-602	6TM-P2

ADJUSTMENTS

RECORDING BIAS ADJUSTMENT

The mechanism and amplifier must be assembled and placed in the cabinet. Turn the unit on and allow to warm up for a few minutes. Remove bottom screen to make test points and adjustments accessible.

Connect the vertical amplifier of scope thru a low capacity probe to point Ⓐ, low side to chassis.

With unit set to "Record" and Volume control turned fully counterclockwise, adjust A1 to obtain the proper scope indication depending on which head is used as specified below:

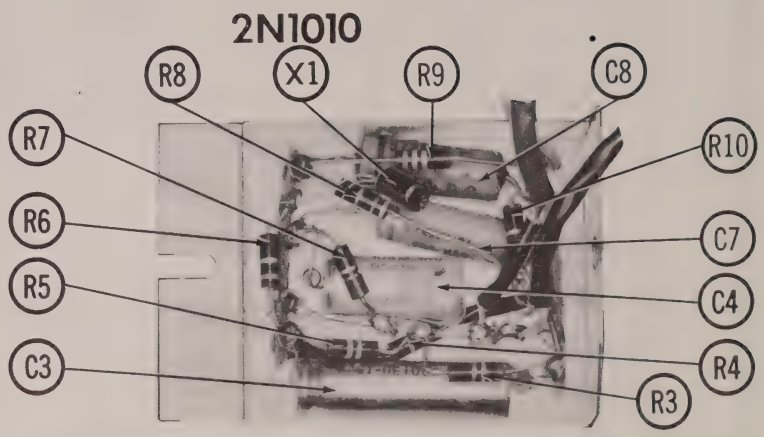
Color at Back of Head	Voltage
Blue	16.8V peak to peak
Yellow	19.6V peak to peak
Black	22.4V peak to peak
Brown	23.8V peak to peak
Orange	25.2V peak to peak
Red	26.6V peak to peak
Green	28V peak to peak
White	30.8V peak to peak
No Code	48.0V peak to peak

There are two color dots on the record head. The top color dot refers to track 2, the bottom color refers to track 1. If they are different, use an "in-between" voltage.

RECORDING LEVEL INDICATOR ADJUSTMENT

Connect the DC probe of VTVM to point Ⓑ, common to chassis. Inject a 1000∿ signal into the "Radio-Phono" Jack. Set the unit into operation with controls at "record" and "Track 1". Adjust generator output and/or tape recorder Loudness control for 9 volts on VTVM. Adjust "Overload" indicator control first counterclockwise and then clockwise until the "Overload" neon bulb barely lights.

PREAMP SUBCHASSIS



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg		108701					Tone
B	150K							Volume
	50K Tap							
C	Switch							Auto. Off (Down) - Standby (Up)
R2A	1meg		103260	TT-69	B47-1meg-S	B11-137	TA16L	Record Level Indicator Adjust.
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	100K	
R4	100K	
R5	150K	
R6	27Ω	
R7	22K	
R8	4700Ω	
R9	560K	
R10	1000Ω	
R11	15K	
R12	27K	
R13	220K	
R14	1800Ω	
R15	1meg	
R16	220K	

ITEM No.	RATING	REMARKS
R17	1800Ω	
R18	100K	
R19	100K	
R20	12K	
R21	220K	
R22	3300Ω	
R23	47K	
R24	180K	
R25	82K	
R26	68K	
R27	47K	
R28	1000Ω	
R29	220K	
R30	270K	

ITEM No.	RATING	REMARKS
R31	330Ω 1W	
R32	10Ω 2W	
R33	10K	
R34	10K	
R35	68K	
R36	10K	
R37	6800Ω 1W	
R38	1000Ω 7W	Pt. #108699 IRC #PW10-1K
R39	150Ω	
R40	8.2Ω	Pt. #101852
R41	8.2Ω	Pt. #101852
R42	8200Ω 2W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA Victor PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Osc. Coil	108012					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .48A	660VCT @ .060A	6.3VCT @ 2.2A	108703						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	108003	A-2935	AU-609	A-3870	24S92	S-5X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	106701	6A1	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Switch	108700	Function (Rotary Type)
M2	Switch	108702	Track Selector
M3	Solenoid	107043	Record-Playback Switch Unlatching
	Microphone	105590	Complete Assembly

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	108693	Volume
Knob	108694	Tone
Knob	108695	Track Selector
Knob	108692	Function Selector
Cabinet	X4670	Ginger/Beige
Handle	108689	Assembly

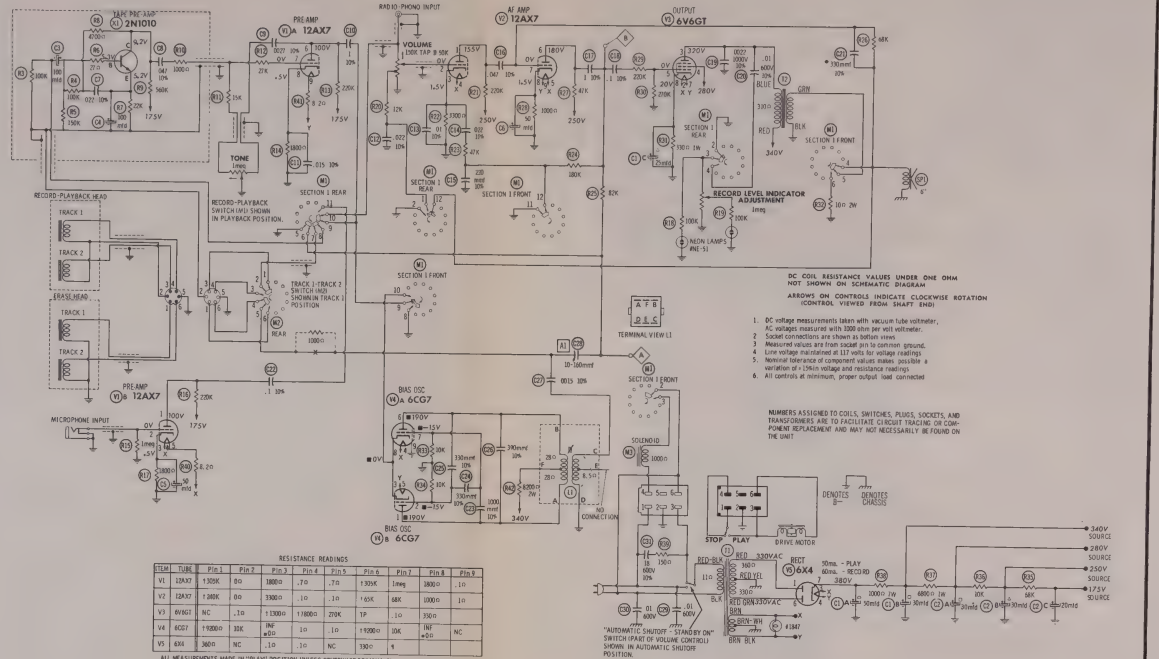
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑320K	0Ω	1800Ω	.7Ω	.7Ω	↑320K	1meg	1800Ω	.1Ω
V2	12AX7	↑260K	0Ω	330Ω	.1Ω	.1Ω	↑65K	68K	1000Ω	.1Ω
V3	6V6GT	NC	.1Ω	↑330Ω	↑1800Ω	270K	1P	.1Ω	330Ω	
V4	6CG7	↑9200Ω	10K	INF ±0Ω	.1Ω	.1Ω	↑9200Ω	10K	INF ±0Ω	NC
V5	6X4	360Ω	NC	.1Ω	.1Ω	NC	330Ω	¶		

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
■ TAKEN IN "RECORD" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT
RESISTANCE MEASUREMENTS FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RCA VICTOR
MODEL CP-1 (Ch. RS-174)

PHOTOFACT® Folder

REALISTIC
MODEL TR167

REALISTIC
MODEL TR167

REALISTIC
MODEL TR167

GENERAL INFORMATION

The Realistic Model TR167 tape recorder is a two-speed tape recorder designed to play and record two tracks of material on standard-width recording tape.

Recordings can be made from a phonograph, radio, or television receiver as well as those made directly from the microphone.

The two tape speeds are 7-1/2 and 3-3/4 ips. Using both tracks, the recording and playing times are as follows:

Reel Size	3-3/4" Speed	7-1/2" Speed
5" (600 ft.)	1 hour	1/2 hour

Model TR167 is designed to operate on 60 cycles, 110-120 volts, AC supply only.

Supplied By:

Radio Shack Corp.
730 Commonwealth Ave.
Boston 17, Massachusetts

SET 507 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ434

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FUNCTION OF CONTROLS

On-Off-Volume

Turn this knob clockwise to turn the power on to the unit. Further rotation increases the volume.

Selector

This control selects the different modes of operations. Turning this control counterclockwise from the Stop position, places the unit in the Rewind mode. Turning the control clockwise from the Stop position, places the unit in Play; and in the second position, places the unit in Record.

Speed Change

With the small brass bushing (9) on flywheel and capstan assembly (15), the speed of the tape is 3-3/4 ips. To change speed to 7-1/2 ips, remove thumb screw (8) from the capstan and take the brass bushing off and place the larger bushing on the capstan shaft supplied with the recorder.

OPERATING INSTRUCTIONS

Threading The Tape

1. Place a reel of tape on supply reel stand (58).
2. Place an empty reel on take-up reel stand (18).
3. Unwind about 10" of tape from the reel. Hold a section taut and insert it in the tape slot. Make sure the dull coated side faces the rear of the recorder.
4. Insert the free end of the tape into one of the radial slots in the hub of the take-up reel. Turn the reel several turns counterclockwise to fasten the tape to the reel and to take up all slack between reels.

To Record From Microphone

1. Rotate the On-Off-Volume control to the right to turn the recorder on. Allow sufficient time for the tubes to warm up.
2. Insert the microphone plug into the "Mike" jack.
3. Set the speed for the desired speed.
4. Turn the Selector knob to the Record position.
5. Hold the microphone about 6 to 12 inches from your mouth and speak in a normal voice.
6. Adjust the volume control until the record level indicator flashes on the loudest passages.

NOTE: Correct volume level on recording is very important. Too weak a signal will result in weak playback and high background noise. Too strong a signal will result in distortion during playback.

Recording Radio Programs

Radio programs may be recorded by one of the following methods:

1. Microphone pickup from speaker of radio — Place the microphone about 6 to 12 inches in front of the radio speaker. Turn the radio volume control to a normal level. Turn the radio tone control to treble or high. Set the recording level and record as under "To Record From Microphone".
2. Direct connection to radio speaker — Make a shielded cable with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals of the radio speaker and insert the plug into the "Mike" jack. Set the radio volume and tone controls as described in Step 1. Set the recording level and proceed as described under "To Record From Microphone".
3. Direct connection to volume control of radio — Make a shielded cable with a two-conductor phone plug on one end. Connect the other end across the radio volume control. Insert the phone plug into the "Mike" jack. Set the recording level and proceed as described under "To Record From Microphone". The setting of the radio volume and tone controls will have no effect on this set-up.

To Record From Phonograph

A phono-type plug is required on the pick-up leads. Insert it into the "Mike" jack and proceed as described under "To Record From Microphone".

To Record From a Television Receiver

Use one of the methods described under "Recording Radio Programs".

Dual Track Recording

These recorders are designed to record and play on one-half the width of the tape at a time; thereby, resulting in two-track recording. After the first recording is completed, remove the full reel from the take-up reel stand (18), turn the reel over and place it on the supply reel stand (58). Then make another recording. The tape can be played back in the same manner.

Rewind

To rewind the tape at a rapid speed, turn the selector knob to the Rewind position.

To Play a Recording

1. Thread the tape as described under "Threading the Tape".

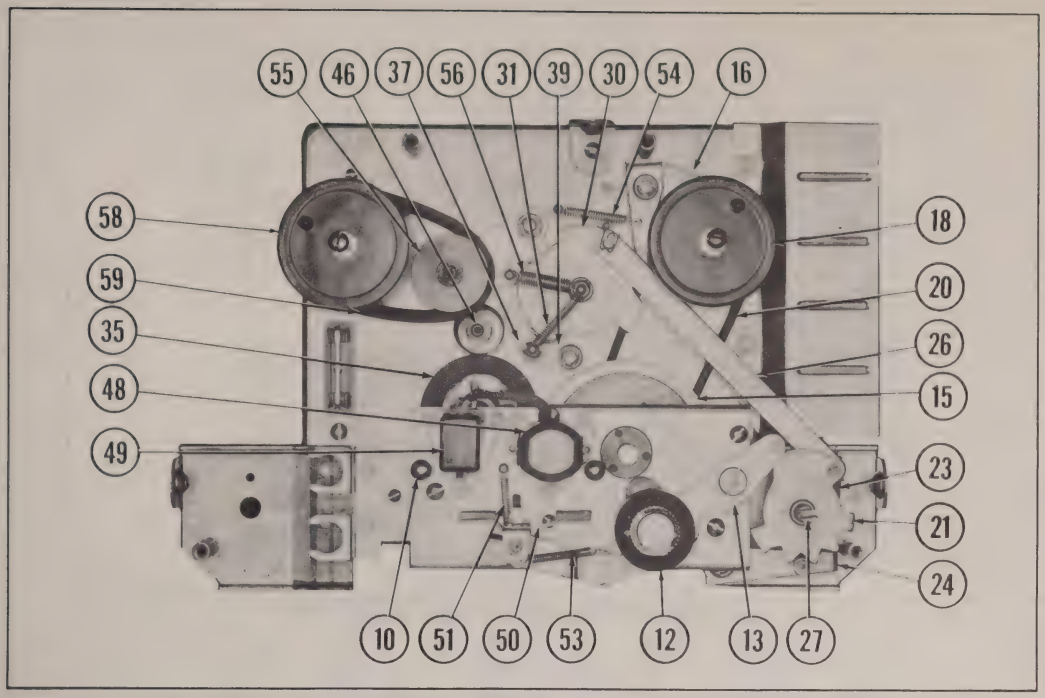


FIG. 1 TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

2. Turn Selector knob to Play position.

3. Adjust the volume control to the desired listening level.

To Erase a Recording

Any recording on the tape is automatically erased before a new recording is made in record position. Should it be desired to erase a recording without recording new material, follow the normal recording procedure but set the volume control to the full counterclockwise position.

To Edit and Splice Tape

NOTE: It is impossible to edit and splice one track without affecting the other. Recordings to be edited should be limited to one track.

1. Tape may be edited by cutting out unwanted portions, or by joining selection into another sequence. Announcements can be inserted between selections, etc. Unused tape can be spliced for reuse.

2. For best results cut tape at a slight diagonal, butt ends together and fasten on the glossy side with splicing tape. Trim off any excessive width.

DISASSEMBLY

To Remove Recorder From the Case

1. Remove head cover (1).

2. Remove On-Off-Volume and Selector Knobs.

3. Remove two screws from escutcheon and remove escutcheon (4).

4. Remove knurled screw (11) from pressure roller shaft and remove pressure roller (12).

5. Remove four screws from top dress plate (5) and remove top dress plate.

6. Remove two screws from the top left side of case, and one from the right top side of case.

7. Lift recorder up and away from case far enough so the speaker leads can be disconnected and power transformer unfastened from bottom of case.

8. Lift entire unit from case.

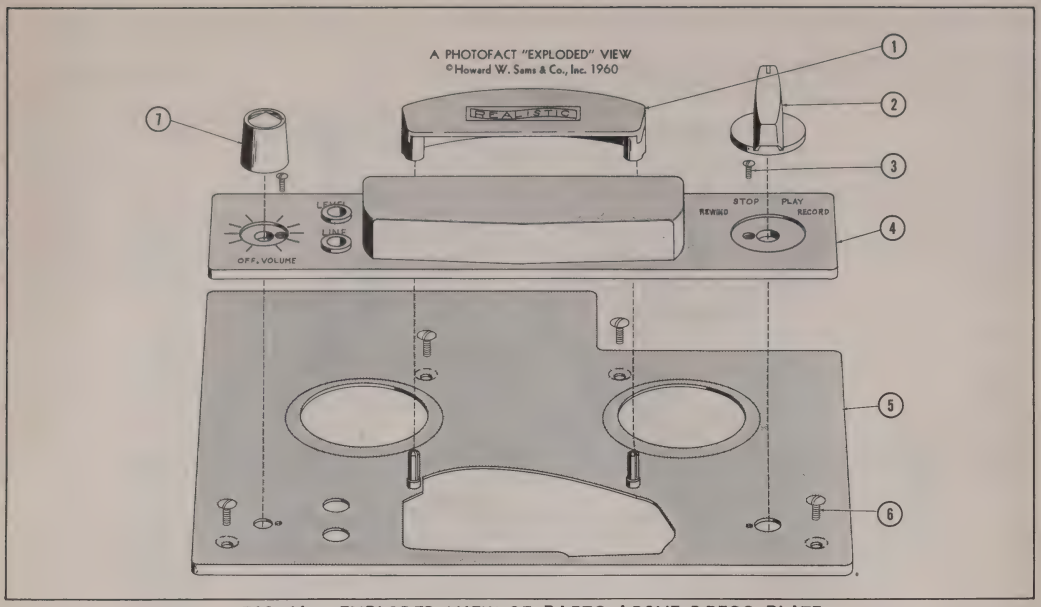


FIG. 2A EXPLODED VIEW OF PARTS ABOVE DRESS PLATE

9. Reverse above procedure to reassemble.

To Remove Amplifier from Tape Transport

1. Remove the hex nut from the On-Off-Volume control and remove the control.
2. Remove the record level and ready lights from their mountings.
3. Disconnect the motor leads from the terminal board.
4. Disconnect the lead running from the On-Off switch to the fuse.
5. Disconnect the black lead running from the terminal board to the fuse.
6. Remove the terminal board from the mounting bracket.
7. Disconnect the record-playback and erase heads.
8. Remove the cover from the chassis.
9. Remove four screws holding the chassis to the chassis mounting brackets.
10. Reverse the above procedure to reassemble.

LUBRICATION

Under normal operation, no lubrication should be required for a long period of time. When the recorder is disassembled for repair, lubricate the bearings with a drop of good grade oil. Lubricate the cams with nonhardening grease. Make sure no lubricant gets on the drive belts or idler wheel.

CLEANING

The tape guides, erase head, record-playback head, pressure roller, and capstan should be cleaned occasionally with alcohol to remove the tape residue from these parts.

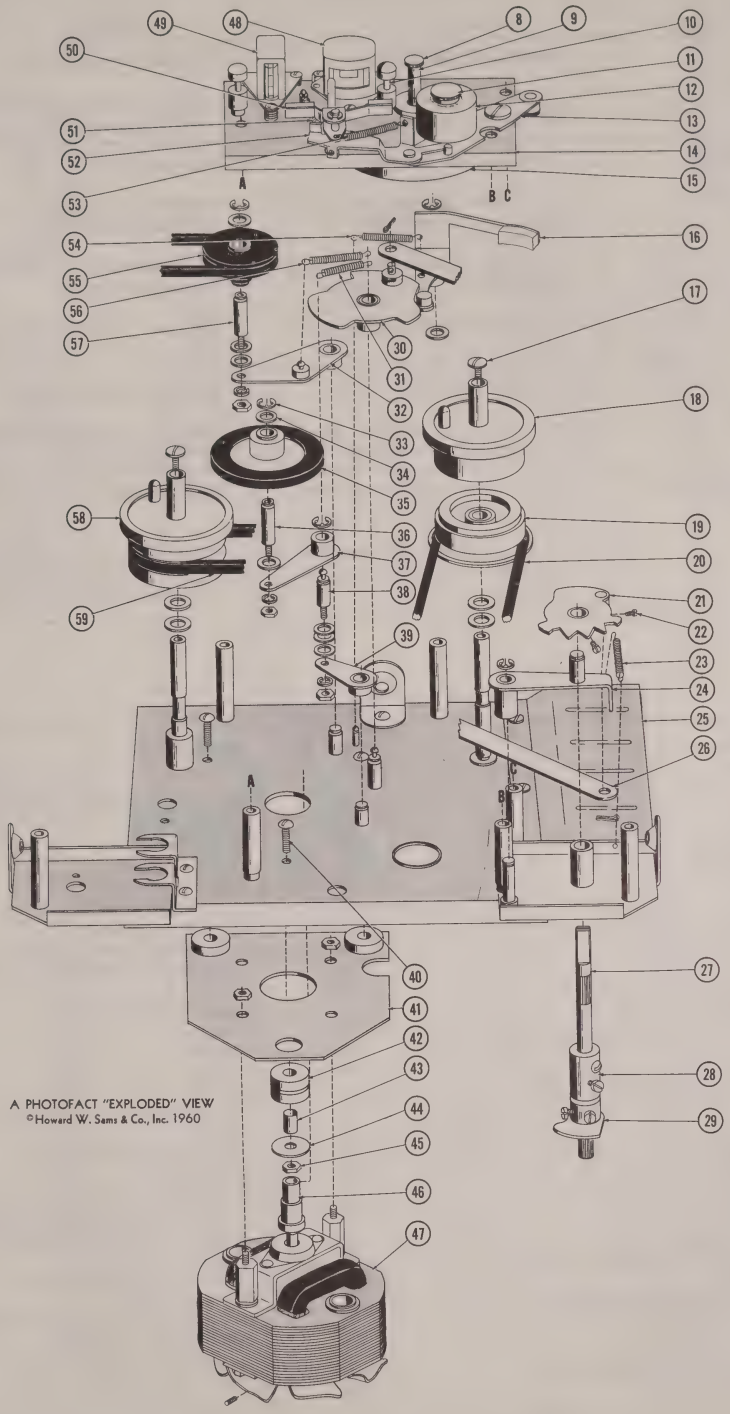


FIG. 2B EXPLODED VIEW OF MECHANISM

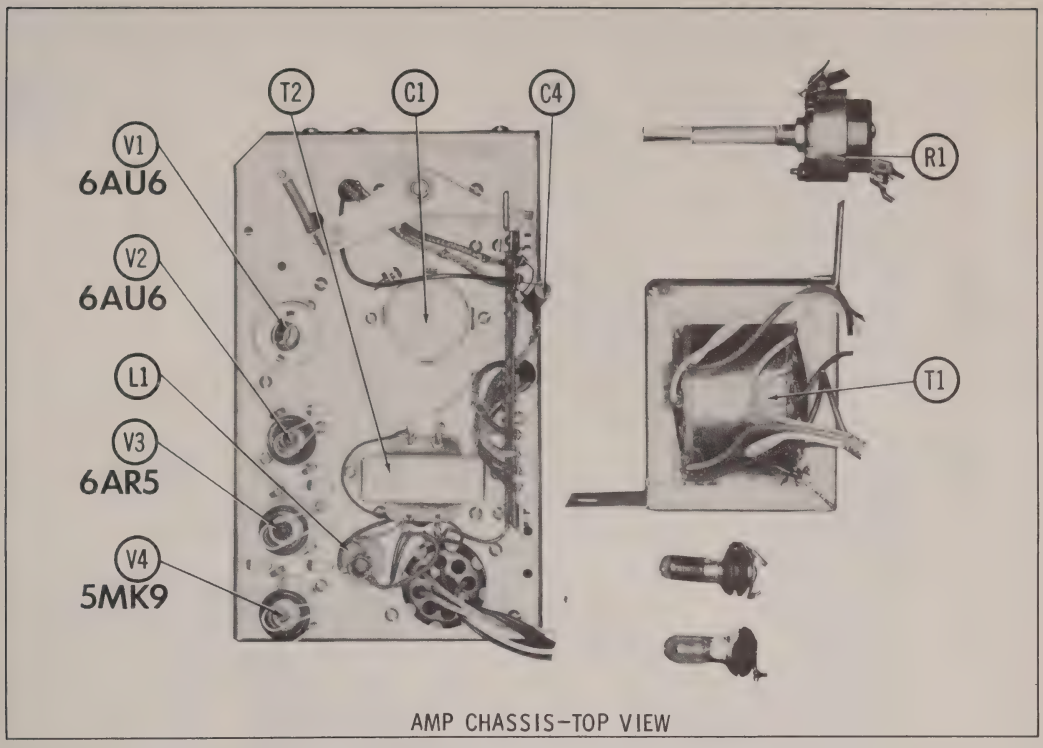
TROUBLE CHART

Symptom	Cause	Remedy
No rewind.	1. Rewind belt (59) broken.	1. Replace rewind belt (59).
	2. Rewind lever tension spring (56) broken or disconnected.	2. Connect or replace rewind lever tension spring (56).
No record or playback.	1. Drive belt (20) broken.	1. Replace drive belt (20).
	2. Idler wheel tension spring (31) broken or disconnected.	2. Connect or replace idler wheel tension spring (31).
	3. Pressure pad tension spring (51) broken or disconnected.	3. Connect or replace pressure pad tension spring (51).
	4. Defective record-playback head (48).	4. Replace record-playback head (48).
No erase.	1. Defective erase head (49).	1. Replace erase head (49).
	2. Pressure pad tension spring (51) disconnected or broken.	2. Connect or replace pressure pad tension spring (51).
Take-up reel spindle slips.	1. Felt washer on take-up reel pulley (19) worn.	1. Replace take-up reel pulley (19).
	2. Oil or grease on drive belt (20), flywheel (15), and take-up reel stand (19).	2. Clean all oil or grease from drive belt (20), from flywheel (15), and take-up reel drive pulley (19).

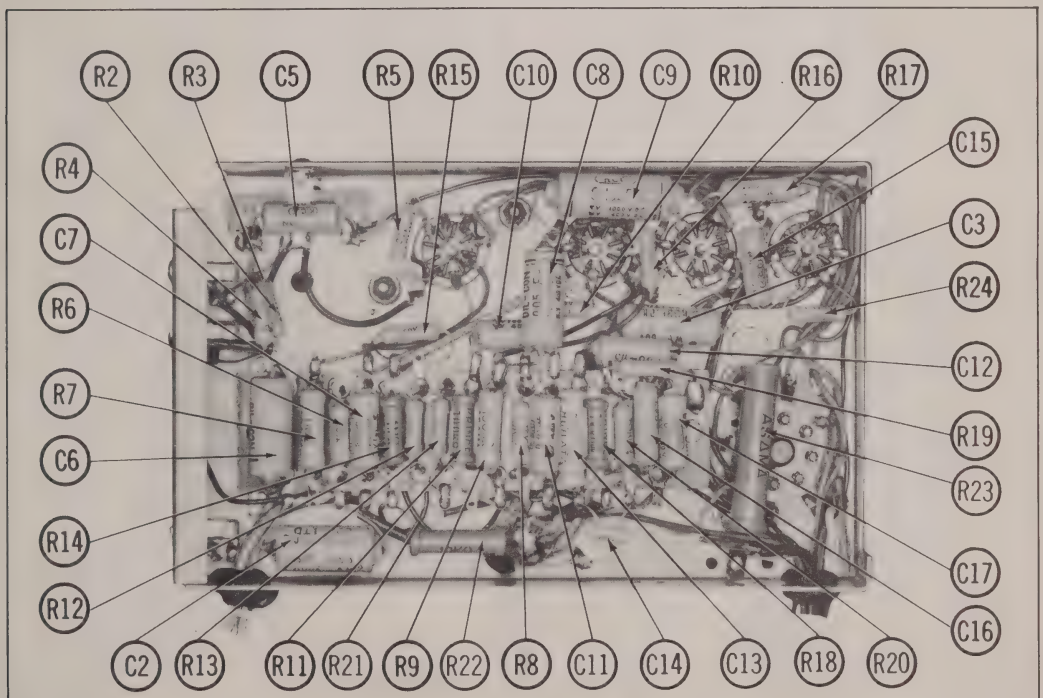
MECHANICAL PARTS LIST

Ref. No.	Description
1	Head Cover
2	Function Control Knob
3	Screw
4	Escutcheon
5	Dress Plate
6	Screw
7	Off-Volume Knob
8	Knurled-Head Screw
9	3-3/4 ips Bushing
10	Tape Guide
11	Knurled-Head Screw
12	Pressure Roller
13	Pressure Roller Actuating Lever
14	Sub-Baseplate
15	Flywheel & Capstan Assembly
16	Brake Lever and Pad Assembly
17	Screw
18	Take-up Reel Stand
19	Take-up Reel Stand
20	Drive Belt
21	Function Cam
22	Set Screw
23	Tension Spring
24	Function Cam Locking Lever
25	Baseplate
26	Function Cam Operating Lever
27	Function Control Shaft
28	Spacer
29	Function Control Shaft Cam
30	Operating Cam

Ref. No.	Description
31	Idler Wheel Tension Spring
32	Rewind Lever
33	"C" Washer
34	Fiber Washer
35	Idler Wheel
36	Idler Wheel Spindle
37	Idler Wheel Lever
38	Idler Wheel Lever Spindle
39	Idler Wheel Pivot Lever
40	Screw
41	Motor Mounting Plate
42	Grommet
43	Spacer
44	Washer
45	Hex Nut
46	Motor Pulley
47	Motor
48	Record-Playback Head
49	Erase Head
50	Pressure Pad Assembly
51	Pressure Pad Tension Spring
52	Pressure Pad Ass'y. Mounting Lever
53	Tension Spring
54	Brake Lever Tension Spring
55	Rewind Pulley
56	Rewind Lever Tension Spring
57	Rewind Pulley Spindle
58	Supply Reel Stand
59	Rewind Drive Belt



AMP CHASSIS–TOP VIEW



AMP CHASSIS—BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	Preamplifier	6AU6
V2	AF Amplifier	6AU6
V3	Bias Osc. -Output	6AR5
V4	Rectifier	5MK9

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	REALISTIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	20	350			C0210	FP330.5	TMT-3423		
B	10	350				TC62			
C	3	350							
C2	3	300		PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C3	10	50		PRS1320	BBR10-50	TC32	TD-10-50	TVA-1304	

FIXED CAPACITORS

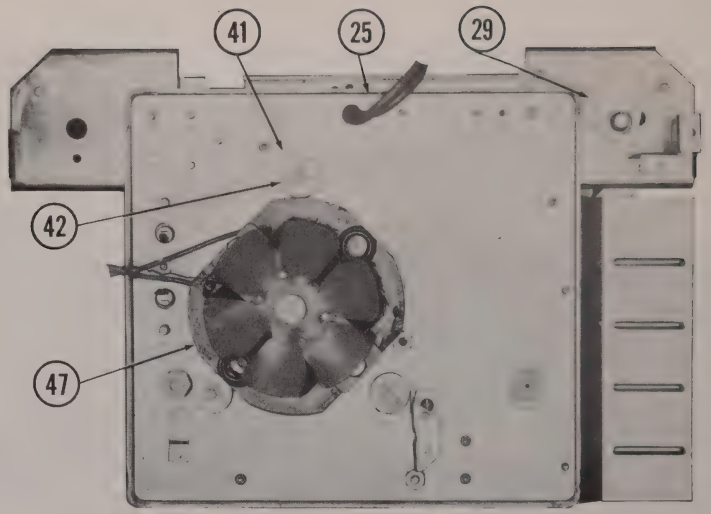
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.001 400V		P488N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C5	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C6	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C8	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C9	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C10	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C11	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C12	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-621	6TM-D20
C13	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T30
C14	60 10%		NPO-SI 62	TCZ-62	C10Q62C	CM-19B-620K		MS-46
C15	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C16	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C17	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REALISTIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K Switch	½		B-60-S				Volume Power Off-On
B				Not Req.				

BOTTOM VIEW OF MECHANISM



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	50K	
R3	500K	
R4	2meg	
R5	2meg	
R6	250K	
R7	1meg 1W	
R8	50K	
R9	150K 1W	

ITEM No.	RATING	REMARKS
R10	600Ω	
R11	100K	
R12	500K	
R13	250K	
R14	1meg	
R15	250K	
R16	500K	
R17	420Ω	

ITEM No.	RATING	REMARKS
R18	100K	
R19	50K	
R20	2000Ω	
R21	50K	
R22	10K 1W	
R23	1000Ω 3W	
R24	100K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		REALISTIC PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Bias Osc.						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	REALISTIC PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .4A Tap @ 110V	300V @ .040A	5V @ .6A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @ 1.1A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REALISTIC PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω	3-4Ω		A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REALISTIC PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	PD-50	5A15Z4	

FUSES

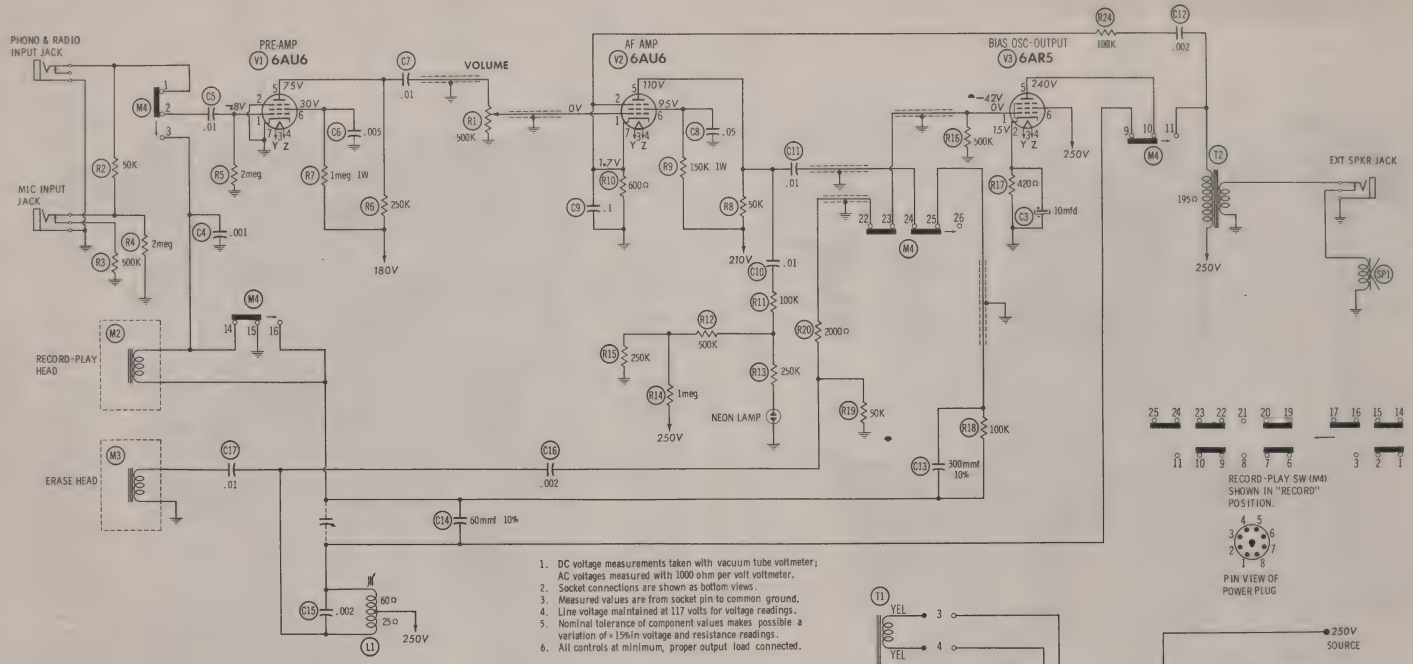
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			REALISTIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1A 250V						

MISCELLANEOUS

ITEM No.	PART NAME	REALISTIC PART No.	NOTES
M2	Head		Play-Record
M3	Head		Erase
M4	Switch		Function (Pushbutton Type)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AU6	2meg	0Ω	.1Ω	.1Ω	†310K	†1meg	0Ω
V2	6AU6	0Ω	600Ω	.1Ω	.1Ω	†60K	†160K	600Ω
V3	6AR5	500K - 50K	420Ω	.1Ω	.1Ω	†2000Ω + †1000Ω	†1000Ω	TP
V4	5MK9	TP	NC	¶	¶	235Ω	TP	TP

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
- MEASURED IN "RECORD" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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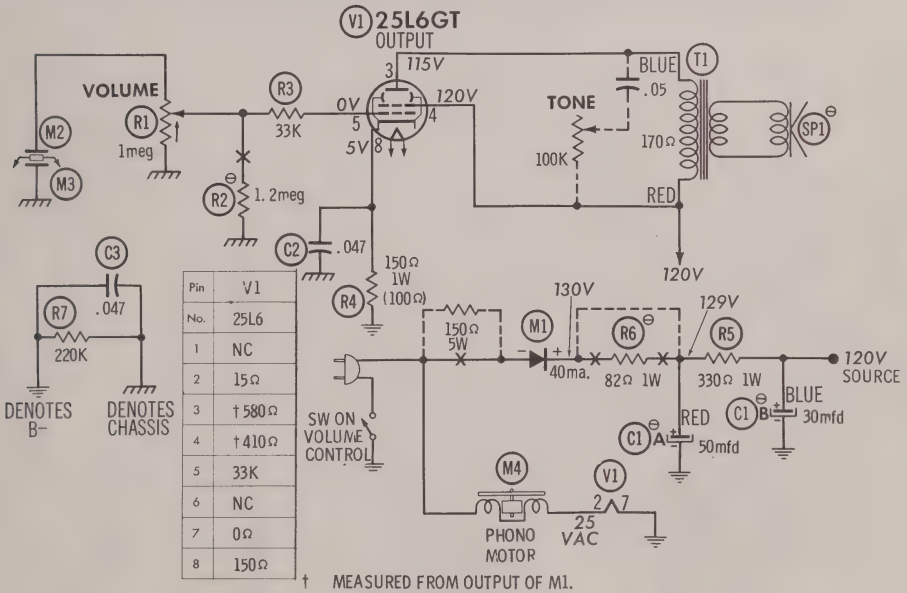
REALISTIC MODEL TR167

PHOTOFACT® Folder

**STEELMAN
MODEL 2-1111**

STEELMAN
MODEL 2-1111

TRADE NAME	Steelman Model 2-1111
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 1 Tube Phono Amplifier With 3 Speed Manual Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 29 Watts, .27 Amp. @ 117 Volts AC



Pin No.	V1 25L6
1	NC
2	15Ω
3	†580Ω
4	†410Ω
5	33K
6	NC
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	♦ GENERAL ELECTRIC ♦	RAYTHEON ♦	SYLVANIA ♦		
V1	Output	25L6GT			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	582005 ①	PRS2200	BBRD5315	TCD497	TDLD-8	TVA-2450	
B	30	150							

① Some versions may use Part #582007 in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	360081	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1.2meg	Note 1
R3	33K	

ITEM No.	RATING	REMARKS
R4	150Ω 1W	(100Ω) *
R5	330Ω 1W	

ITEM No.	RATING	REMARKS
R6	82Ω 1W	Note 1
R7	220K	

Note 1. Not used in some versions.
* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	3-4Ω	430330	A-3025	AU-605	A-3332	24S53	S-12X	

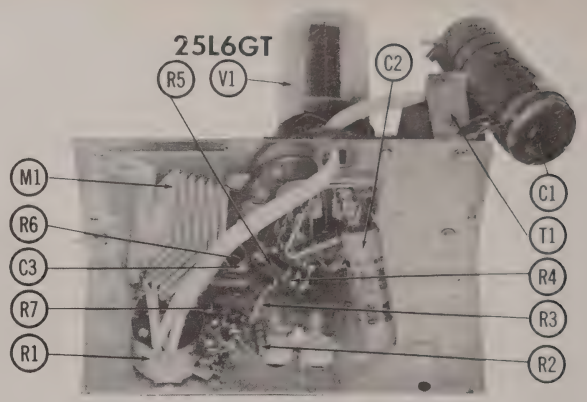
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	404003 *	4A07	* Alternate Part #404011 or 404012

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.040A	380001 *		1N1763 ♦	65A *	SR200 ♦	* Selenium Type ♦ Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		18	N6-2						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M3		J-352 † or J-352D ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M4	Motor	311021	Turntable Drive, (G.I. 90V 3 Speed)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	270101	Red, Volume
Cabinet	240990	Pink & White

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

ZENITH MODEL Royal 755L (Ch. 8CT41, 8CT41Z2)

ZENITH MODEL Royal
755L (Ch. 8CT41, 8CT41Z2)

TRADE NAME	Zenith Model Royal 755L (Ch. 8CT41, 8CT41Z2)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	9MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1620KC
	15MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

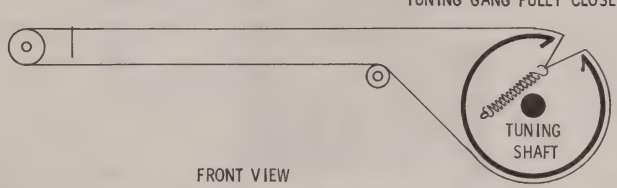
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	600KC	Tune to 600KC Signal.	"	A5	Adjust for maximum output while rocking tuning gang.
4.	"	1260KC	Tune to 1260KC Signal.	"	A6, A7	Adjust for maximum output.

DIAL CORD STRINGING



FRONT VIEW

ZENITH MODEL Royal
755L (Ch. 8CT41, 8CT41Z2)

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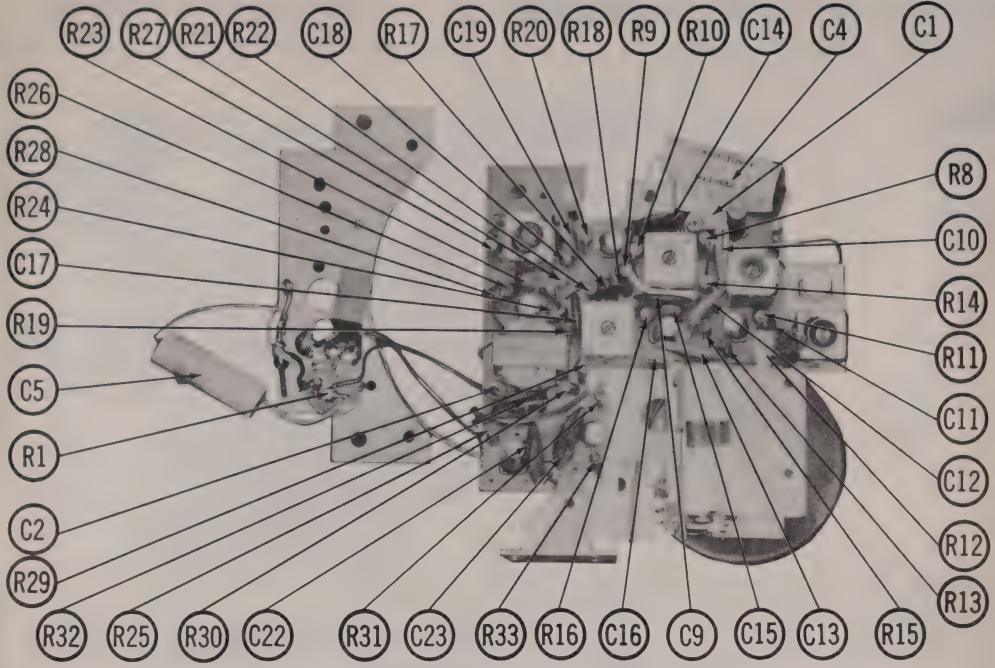
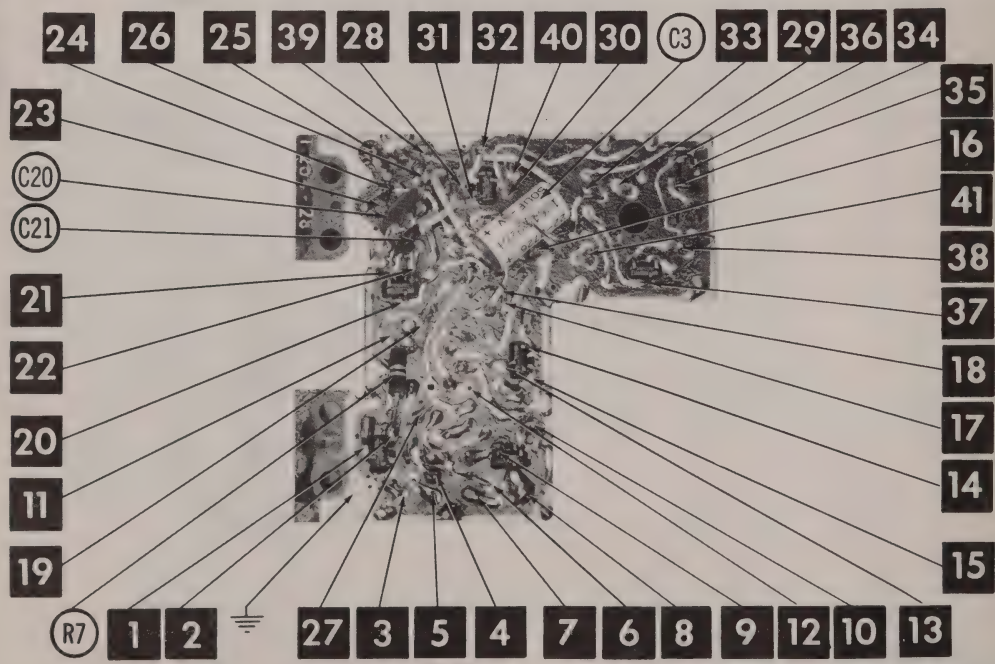
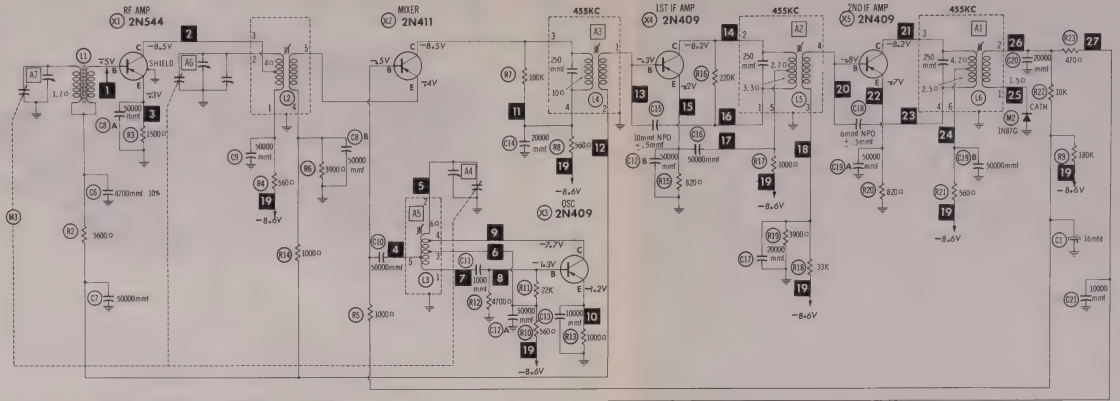


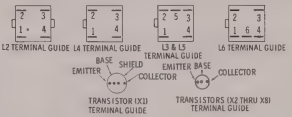
CHASSIS-TOP VIEW-CAPACITOR AND RESISTOR IDENTIFICATION



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD





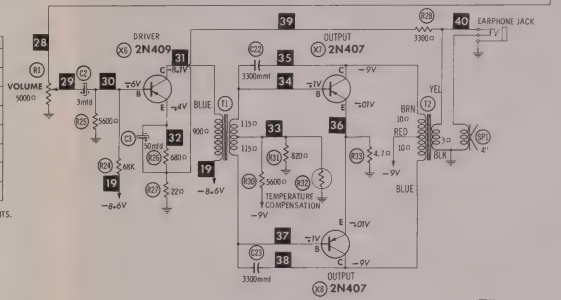
RESISTANCE READINGS

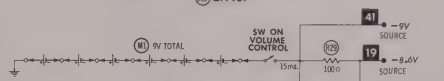
ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N544	10K	1500Ω	↑660Ω
X2	2N411	13K	3900Ω	↑660Ω
X3	2N409	4700Ω	1000Ω	↑660Ω
X4	2N409	4900Ω	820Ω	↑1100Ω
X5	2N409	3500Ω	820Ω	↑660Ω
X6	2N407	5200Ω	700Ω	↑1000Ω
X7	2N407	230Ω	4.7Ω	↑10Ω
X8	2N407	230Ω	4.7Ω	↑10Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R29 AND C5.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.





A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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ZENITH MODEL Royal 755L (Ch. 8CT41, 8CT41Z2)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N544	RF Amplifier	2N544	2N487	2N544	PNP
X2	2N411	Mixer	2N411	2N486	2N411	PNP
X3	2N409	Oscillator	2N409	2N485	2N409	PNP
X4	2N409	1st IF Amplifier	2N409	2N483	2N409	PNP
X5	2N409	2nd IF Amplifier	2N409	2N483	2N409	PNP
X6	2N407	Driver	2N407	2N362	2N407	PNP
X7	2N407	Output	2N407	2N632	2N407	PNP \ Matched
X8	2N407	Output	2N407	2N632	2N407	PNP / Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	16	3	22-2871	PWE3015	NLW15-6	TT6X15	ML20-6	TE-1053.5	
C2	3	12	22-2864	PWE25003	NLW5-15	TT12X3	ML4-15	TE-1122	
C3	50	6	22-2726	PWE6050	NLW50-6	TT6X50	ML50-6	TE-1100	
C4	100	10	22-3023	PWE10100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C5	100	10	22-3023	PWE10100	NLW100-10	TT15X100	ML100-15	TE-1119.3	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	4700 10%		DI-4700			CCD-472	JL-247	10TS-D47
C7	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C8A	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
B	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C9	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C10	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C11	1000		BPD-001	DD-102	H-05D1	CCD-102	B-210	5HK-D10
C12A	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
B	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C13	10000		C80V103AM	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C14	20000		C80V203AM	DA-203	H-05S2	CCD-203	TA-120	TG-S20
C15	10 NPO ± .5mmf		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C16	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C17	20000		C80V203AM	DA-203	H-05S2	CCD-203	TA-120	TG-S20
C18	6 NPO ± .5mmf		NPO-DI 5.0		C10V5C	CCTO-050		10TCC-V56
C19A	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
B	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C20	20000		C80V203AM	DA-203	H-05S2	CCD-203	TA-120	TG-S20
C21	10000		C80V103AM	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C22	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C23	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5000Ω	1/4	63-4646					Volume
B	Switch							Power Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	5600Ω	
R3	1500Ω	
R4	560Ω	
R5	1000Ω	
R6	3900Ω	
R7	100K	
R8	560Ω	
R9	180K	
R10	560Ω	
R11	22K	
R12	4700Ω	

ITEM No.	RATING	REMARKS
R13	1000Ω	
R14	1000Ω	
R15	820Ω	
R16	220K	
R17	1000Ω	
R18	33K	
R19	3900Ω	
R20	820Ω	
R21	560Ω	
R22	10K	
R23	470Ω	

ITEM No.	RATING	REMARKS
R24	68K	
R25	5600Ω	
R26	680Ω	
R27	22Ω	
R28	3300Ω	
R29	100Ω	
R30	5600Ω	
R31	820Ω	
R32	Temp. Comp.	Pt. #63-3663
R33	4.7Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	S-47699					
L2	RF Trans.	95-1702					
L3	Osc. Coil	95-1597					
L4	1st IF Trans.	95-1594					
L5	2nd IF Trans.	95-1595					
L6	3rd IF Trans.	95-1586					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	95-1598		TA-36①	TR-6①		① Remove Channel Frame

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	540Ω CT	3-4Ω	95-1598				TR-27		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-910	4A1 ▲	▲ Fabricate mounting bracket to replace original.

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	Z-7 *		930 *		635 *		M-14R *	* 6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N87G	103-19	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-3208	3 Gang

CABINETS & CABINET PARTS

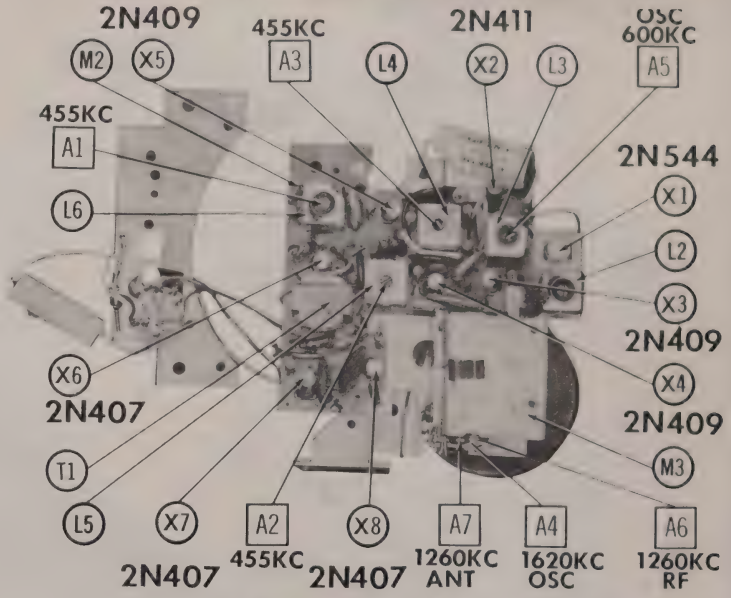
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

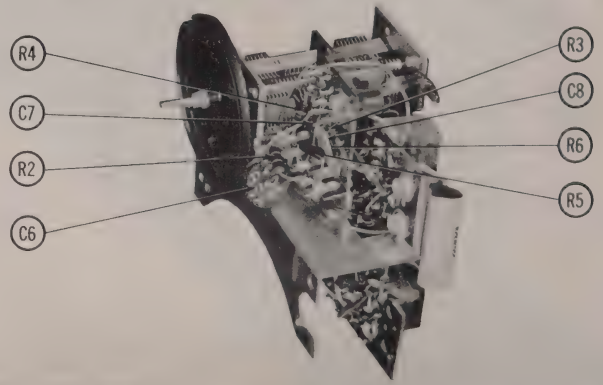
NAME	PART NO.	DESCRIPTION
Knob	S-47708	Tuning (Includes Spring Assembly)
Knob	S-47709	Volume (Includes Spring Assembly)
Pointer	59-356	
Dial Scale	26-655	
Cabinet	14-2851	

WIRING DATA

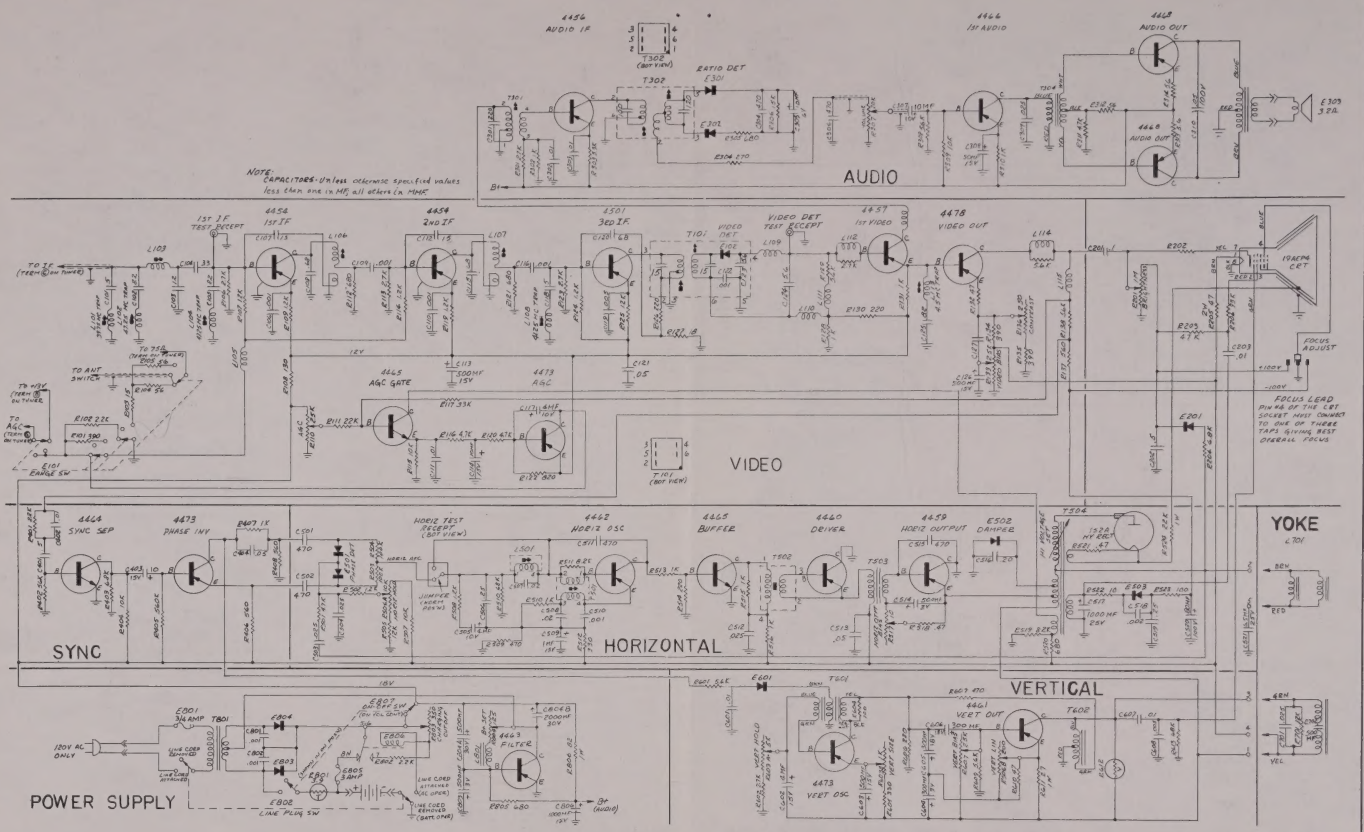
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW





RF CHASSIS

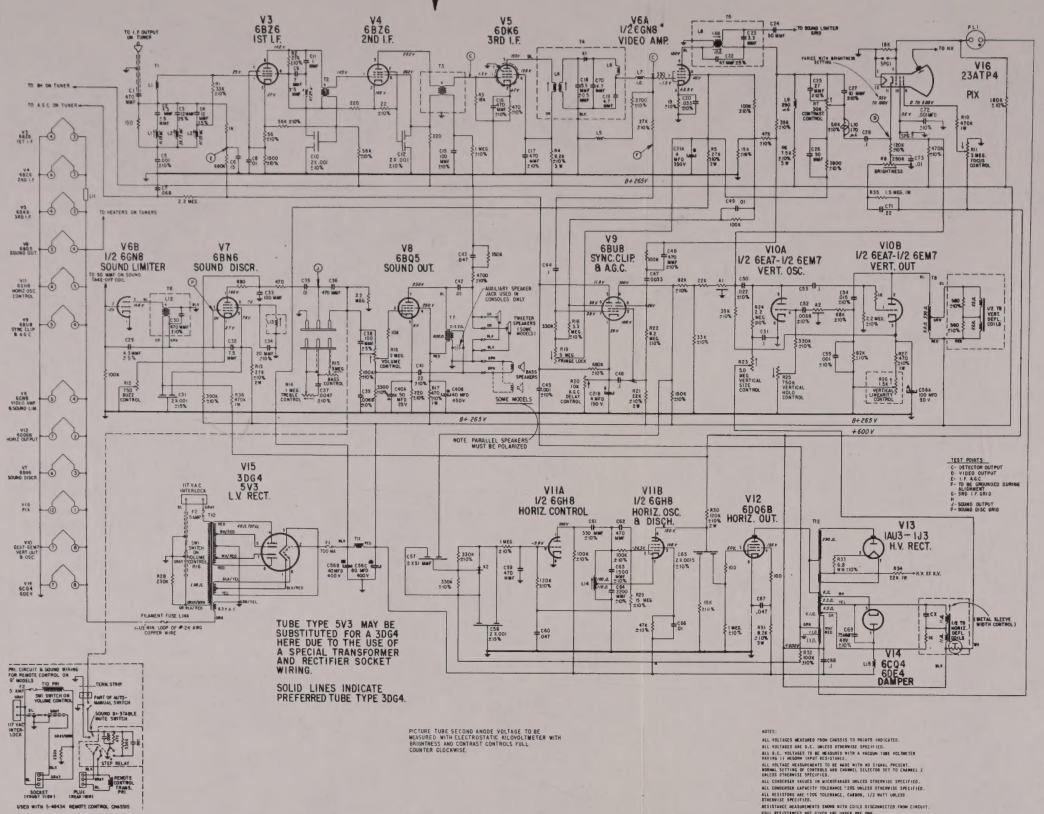


MOTOROLA MODELS 19P1-1, -2 (CH. TS-432)

Schematic Diagram Courtesy of Motorola Inc.

← MOTOROLA

ZENITH


V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6DK6 3RD I.F.
V6A 1/2 6GN8 VIDEO AMP.
V16 23ATP4 PIX
V6B 1/2 6GN8 SOUND LIMITER
V7 6BN6 SOUND DISCR.
V8 6BQ5 SOUND OUT.
V9 6BU8 SYNC.CLIP. & A.G.C.
V10A 1/2 6EA7-1/2 6EM7 VERT. OSC.
V10B 1/2 6EA7-1/2 6EM7 VERT. OUT
V15 3DG4 5V3 L.V. RECT.
V11A 1/2 6GH8 HORIZ. CONTROL
V11B 1/2 6GH8 HORIZ. OSC. & DISCH.
V12 6DQ6B HORIZ. OUT.
V13 1AU3 – 1J3 H.V. RECT.
V14 6CG4 6DE4 DAMPER
TUBE TYPE 5V3 MAY BE SUBSTITUTED FOR A 3DG4 HERE DUE TO THE USE OF A SPECIAL TRANSFORMER AND RECTIFIER SOCKET WIRING.
SOLID LINES INDICATE PREFERRED TUBE TYPE 3DG4.
NOTE: PARALLEL SPEAKERS MUST BE POLARIZED
PICTURE TUBE SECOND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC KILOVOLTMETER WITH BRIGHTNESS AND CONTRAST CONTROLS FULL COUNTER CLOCKWISE.
TEST POINTS
NOTES:
ALTERNATE BRIGHTNESS CIRCUIT
EQUIVALENT CIRCUIT A-1 and A-2 INTEGRATORS
87-4 R is 47K
87-5 R is 33K

CIRCUIT FUNCTION
SPG 1 AND SPG 2 SPARK GAPS

SPG 1 slips over pins 1 and 2 of the picture tube. The gap prevents heater burnout, should an arc occur in the gun. If the picture tube is replaced, install the gap as on the original tube. SPG 2 similarly protects integrator A1.

HORIZONTAL BLANKING CIRCUIT

A negative pulse from the horizontal sweep transformer (violet lead) is applied to grid 1 (pin 2) of the picture tube which cuts off the beam during the horizontal retrace period. The neon bulb acts as a switch which allows the pulse to pass through, but blocks off any transients that may reach the grid during the trace period.

ZENITH MODELS F2858R, RU, F2860M, MU, R, RU, F2862W, WU, F3360W, Y, F3364W, Y, F3368M, R, F3370W, F3375L, F3380W, Y, F3385H (CH. 16F28, Q, U()

Schematic Diagram Courtesy of Zenith Radio Corporation

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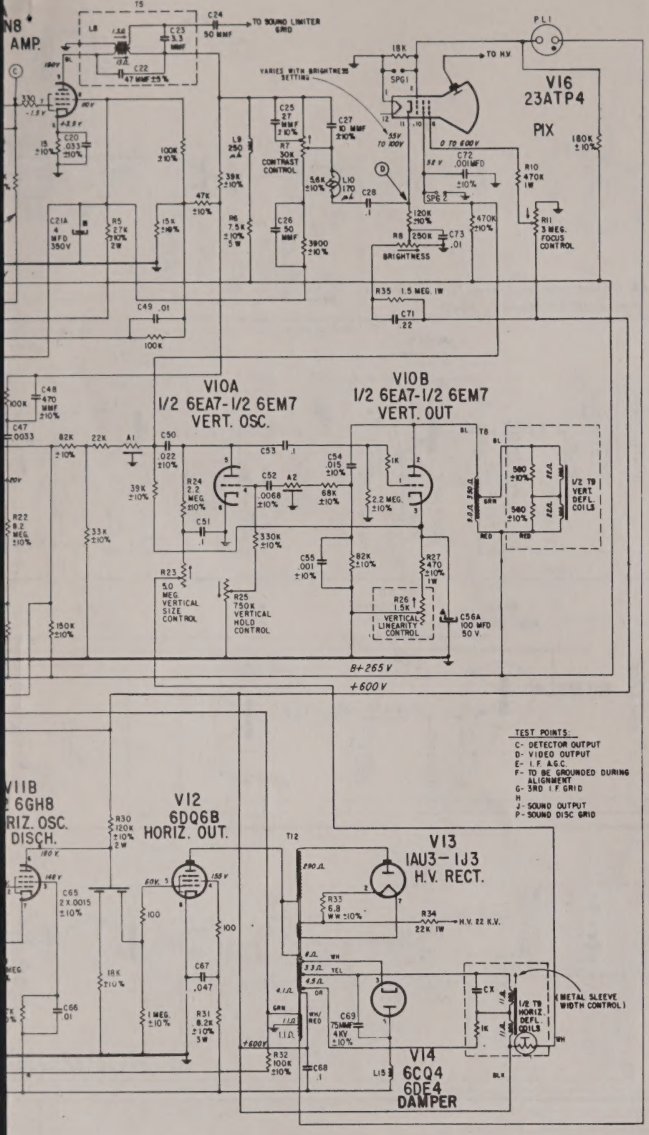
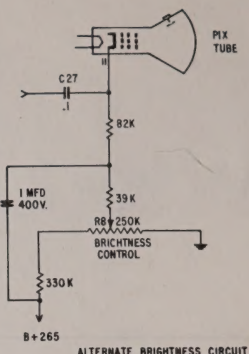
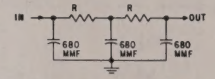




ALTERNATE BRIGHTNESS CIRCUIT



EQUIVALENT CIRCUIT
A-1 and A-2 INTEGRATORS

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HORIZONTAL BLANKING CIRCUIT

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NOTES:
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL D.C. VOLTAGES TO BE MEASURED WITH A VACUUM TUBE VOLTMETER HAVING 11 MEGOHM INPUT RESISTANCE.
ALL VOLTAGE MEASUREMENTS TO BE MADE WITH NO SIGNAL PRESENT. NORMAL SETTING OF CONTROLS AND CHANNEL SELECTOR SET TO CHANNEL 2 UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER CAPACITY TOLERANCE ±20% UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE, CARBON, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
RESISTANCE MEASUREMENTS SHOWN WITH COILS DISCONNECTED FROM CIRCUIT.
COIL RESISTANCES NOT GIVEN ARE UNDER ONE OHM.
CATHODE RAY TUBE 2ND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC OR 20K MIN. OHM PER VOLT HIGH VOLTAGE METER.
ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION.
Ⓐ ALIGNMENT POINTS
CIRCLED LETTERS INDICATE ALIGNMENT AND TEST POINTS.

⏚ DENOTES CHASSIS

F3364W, Y,

Schematic Diagram Courtesy of Zenith Radio Corporation